A Dissertation On
"EFFICACY OF AJNA CHAKRA MEDITATION IN PRIMARY INSOMNIA"

Submitted by
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DOCTOR OF MEDICINE
IN
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Under the Guidance of

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The Institution Ethical Committee of Government Yoga & Naturopathy Medical College & Hospital, Chennai reviewed and discussed the application for approval of **"EFFICACY OF AJNA CHAKRA MEDITATION IN PRIMARY INSOMNIA- AN EXPERIMENTAL STUDY."** for project work submitted by

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The proposal is APPROVED.

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Date**:**

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LIST OF ABBREVATIONS

REM	Rapid eye movement
NREM	Non rapid eye movement
EEG	Electroencephalogram
DIMS	Difficulty initiating and maintaining sleep
NOS	Not otherwise specified
COPD	Chronic obstructive pulmonary disease
CHF	Congestive heart failure
OSA	Obstructive sleep apnea
HPA	Hypothalamic-pituitary-adrenal axis
CBT	Cognitive behavioural treatment
SRT	Sleep restriction therapy
TST	Total sleep time
MAPs	Mindful awareness practices
SHE	Sleep hygiene education
MPH	Master of public health
TM	Transcendental meditation
SWS	Slow wave sleep
EMG	Electromyogram
TSH	Thyroid stimulating hormone
GABA	Gamma amino butyric acid
PSQI	Pittsburgh sleep quality index

ABSRACT

OBJECTIVE: The intended research work aims at assessing the effectiveness of Ajna chakra Meditation in primary insomnia. Many studies reported that the practice of yoga, especially meditation influences sleep. The current study was conducted to determine the positive effect of practicing ajna chakra meditation in improving the quality of sleep through the measurement of Athens insomnia scale and Pittsburgh sleep quality Index.

STUDY DESIGN: The current research work employed prospective intervention study.

METHOD: 43 participants of age group between 20-40yrs are participated in the study. on the first visit Athens sleep scale, Pittsburgh sleep quality index, has been given to collect the details about patients sleep history, trigger factors, relieving factors, treatment history and to assess their lifestyle pattern. Patients are given ajna chakra meditation 30mins thrice in a week in alternative days for 12 weeks. After the period of 3 months same Pittsburgh sleep quality index and Athens sleep scale is given to assess the effectiveness of the intervention.

RESULTS: The study showed significant improvement in the quality of sleep of the study participants.

CONCLUSION: The practice of ajna chakra meditation facilitates in improving the quality of sleep.

KEYWORDS: Sleep,Athens scale, Pittsburgh sleep quality index,Meditation.

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1.0 INTRODUCTION

Insomnia is a highly pervasive condition. Approximately one third to one fourth of the population in industrialized nations report sleep disturbance problems at some point in their lives and approximately 10 per cent suffer from persistent insomnia .The goals of insomnia treatment are to improve quantitative and qualitative aspects of sleep, to reduce the distress and anxiety associated with poor sleep, and to improve daytime function.[1]

The word yoga means 'unity' or 'oneness' it is derived from the Sanskrit word ‘yuj’ which means 'to join'. This unity or joining is describe in spiritual expressions as the union of the individual consciousness with the universal consciousness.[2] On a practical level, yoga is a means of balancing and harmonising the body, mind and emotions

According to sage patanjali who is the father of yoga defines yoga as

"yogaḥ cittavṛtti nirodhaḥ"[3]

The skill of yoga is demonstrated by the conscious non-operation of the vibration modes of the mento emotional energy.[3]

According to Swami Satyananda Saraswati a yoga guru defines yoga as "Yoga is not an ancient myth buried in oblivion. It is the most valuable inheritance of the present. It is the essential need of today and the culture of tomorrow."[1]

Meditation practices have been a life style practiced in India thousands of years ago. Skilful meditative practices help to integrate the brain functions, control various physiological mechanisms resulting in a state of mental and physical well being.

Intense meditation practices help to achieve a harmony between body and mind. Meditation practices influence brain functions, induce various intrinsic neural plasticity events, modulate autonomic, metabolic, endocrine, and immune functions and thus mediate global regulatory changes in various behavioural states including sleep.

This brief review focuses on the effect of meditation as a self regulatory phenomenon on sleep. The most ancient sourcebook for yoga practice, Patanjali's Yoga Sutra describes how the mind works and how we can integrate yoga into our lives.

Concentration on ajna chakra, the point of bhrumadhya at the eyebrow centre is used. During the meditation on the ajna chakra, Visualise a tiny point of light or an "om" symbol at the eyebrow centre and let the thoughts reside on the inner guru.[2]

Ajna chakra being related to the central nervous system in general sight and insight in particular. The endocrine gland which is utilized or influenced is the pineal gland which secretes the peace of mind hormone melatonin and the mind opening hormone pinoline.It is responsible in unison with hypothalamus, for the sleep and waking cycle.[4]

Thus, ajna chakra is known to be related to the functioning of pineal gland which in turn mediates the sleep cycle through the melatonin hormone. Ajna chakra meditation might play a valuable role in regulating the sleep cycle.

It is said that 10% to 30% of adults have insomnia at any given point of time and up to half of people have insomnia in a given year. Also it is said that

there are higher rates of insomnia reported among university students compared to the general population.

In my study I would like to analyse the efficacy of ajna chakra meditation among IT professionals and medical college students. Since various studies were carried out in the field of yoga in regulating sleep in insomnia patients, and also general meditation was employed in improvement of symptoms of sleep and regulating the sleep-wake cycles,

I would like to be specific to check the influence of ajna chakra for the same. Hence the study would like to explain the effect of ajna chakra meditation on the patients of primary insomnia, to improve their symptoms and regulate the sleep wake cycle via the pineal gland hormonal functioning system.

2.0 AIMS AND OBJECTIVES

2.1 AIM:

To assess the effectiveness of Ajna chakra Meditation in primary insomnia

2.2 OBJECTIVES OF THE STUDY:

To evaluate the ajna chakra meditation in improving the quality of sleep through the measurement of:

- Athens insomnia scale
- Pittsburgh sleep quality Index

3.0 REVIEW OF LITERATURE

Sleep is a reversible behavioural state of perceptual disengagement from and unresponsiveness to the environment. It is also true that sleep is a complex amalgam of physiologic and behavioural processes. Sleep is typically (but not necessarily) accompanied by postural recumbence, behavioural stillness, closed eyes, and all the other indicators one commonly associates with sleeping.[5]

Normal human sleep comprises two states—rapid eye movement (REM) and non–REM (NREM) sleep— that alternate cyclically across a sleep episode. State characteristics are well defined: NREM sleep includes a variably synchronous cortical electroencephalogram (EEG; including sleep spindles, K complexes, and slow waves) associated with low muscle tonus and minimal psychological activity; the REM sleep EEG is desynchronized, muscles are atonic, and dreaming is typical[6]

Within sleep, two separate states have been defined on the basis of a constellation of physiologic parameters. These two states, rapid eye movement (REM) and non-REM (NREM), exist in virtually all mammals and birds yet studied, and they are as distinct from one another as each is from wakefulness.
NREM (pronounced “non-REM”) sleep is conventionally subdivided into four stages defined along one measurement axis, the electroencephalogram (EEG).

The EEG pattern in NREM sleep is commonly described as synchronous, with such characteristic waveforms as sleep spindles, K-complexes, and high voltage slow waves. The four NREM stages (stages 1, 2, 3, and 4) roughly parallel a depth-of sleep continuum, with arousal thresholds generally lowest in

stage 1 and highest in stage 4 sleeps. NREM sleep is usually associated with minimal or fragmentary mental activity. A shorthand definition of NREM sleep is a relatively inactive yet actively regulating brain in a movable body.[6]

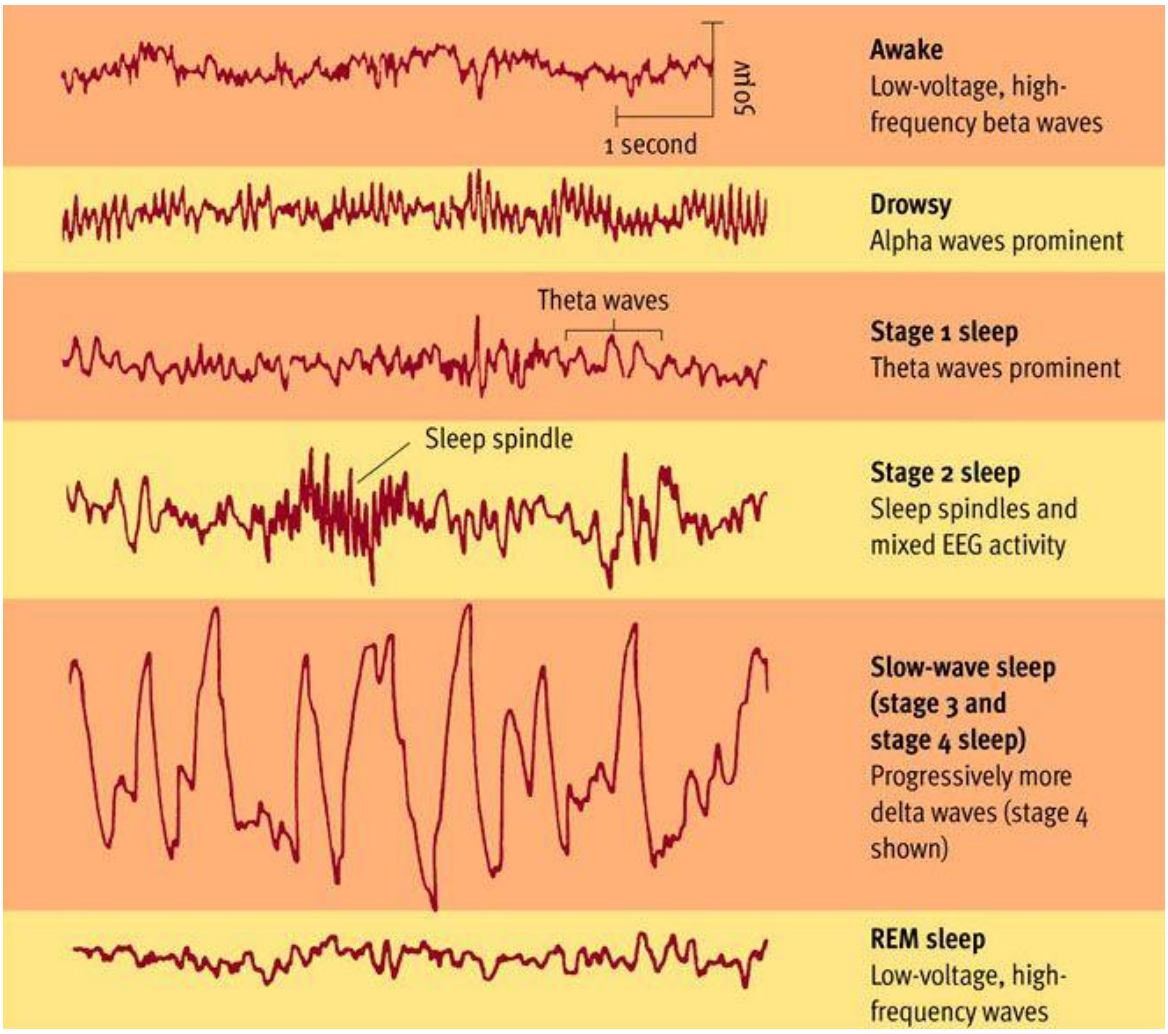


Figure 1. EEG Activity in different stages of sleep

3.1 DEFINITION OF INSOMNIA

The term insomnia is used in a variety of ways in the medical literature. Insomnia is defined by the presence of an individual's report of difficulty with sleep.[5]

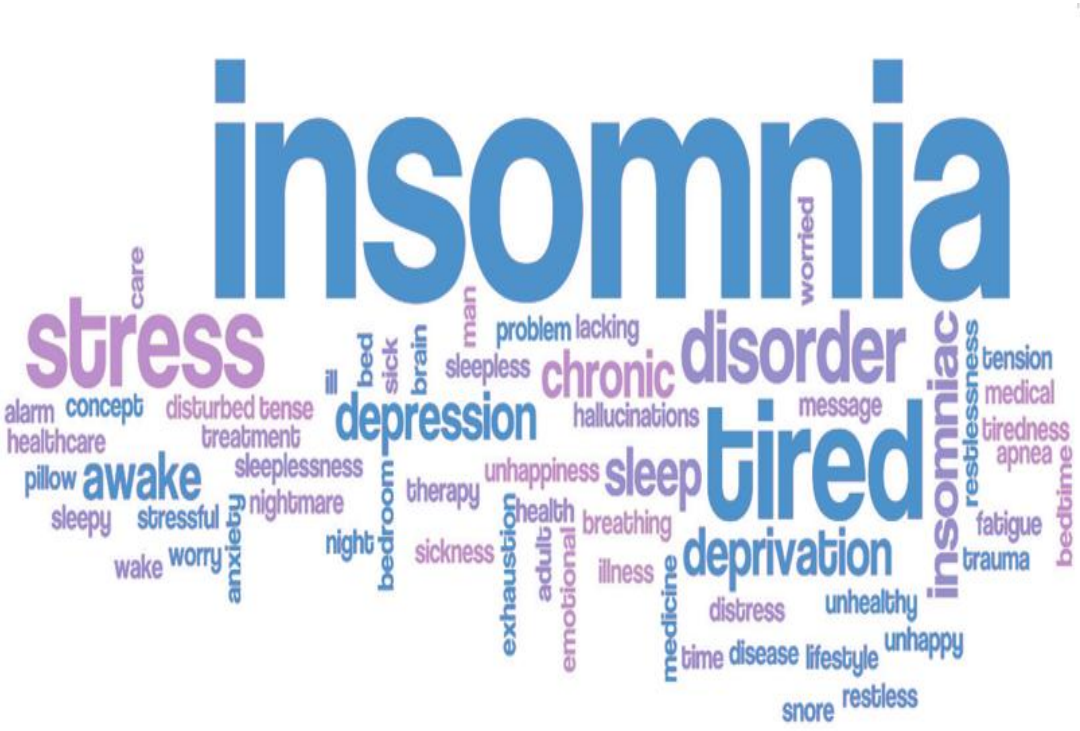


Figure: 2 Causes of Insomnia

For example, in survey studies, insomnia is defined by a positive response to either question, “Do you experience difficulty sleeping?” or “Do you have difficulty falling or staying asleep?” In the sleep literature, insomnia is sometimes used as a term to describe the presence of polysomnographic evidence of disturbed sleep. Thus, the presence of a long sleep latency, frequent nocturnal awakenings, or prolonged periods of wakefulness during the sleep period or even frequent transient arousals are taken as evidence of insomnia.[8]

3.2 PREVALENCE OF INSOMNIA

In the general population ranges between 8-40%, depending on the definition used. While 20-30% of the general population has poor sleep (i.e., insomnia symptoms of difficulty initiating or maintaining sleep, early morning awakening, or non-restorative sleep at any given time), another 8-10% of the population suffers from chronic insomnia.[8,9] Also, about 4% of the population use sleeping pills in a regular basis.[10]

A cross-sectional study conducted at the National Institute of Mental Health and Neurosciences, Bangalore, jointly by the departments of Neurology and Epidemiology over a one-year period. The study protocol was approved by the Institution Ethics Committee. Informed consent was translated and back-translated into five different regional languages spoken in South India. The pilot study assessed the feasibility and applicability of the questionnaire in 50 individuals and estimated problems in response

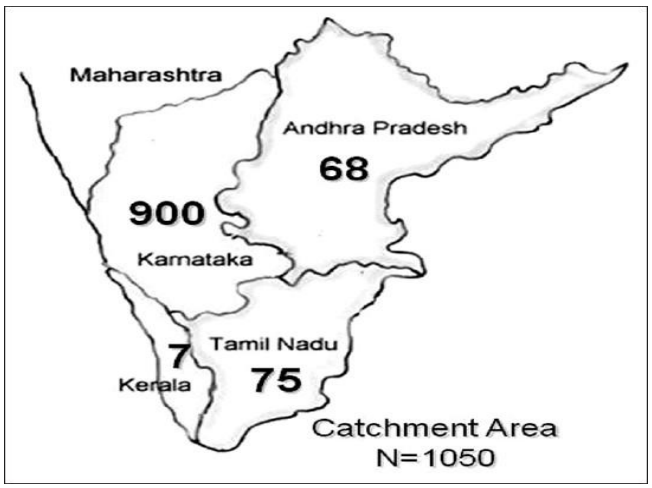


Figure 3: Distribution of the study population in the southern Indian states

The study enrolled 1050 healthy subjects prospectively. Most were from Karnataka while residents of the other three southern Indian states were represented [Figure 3].

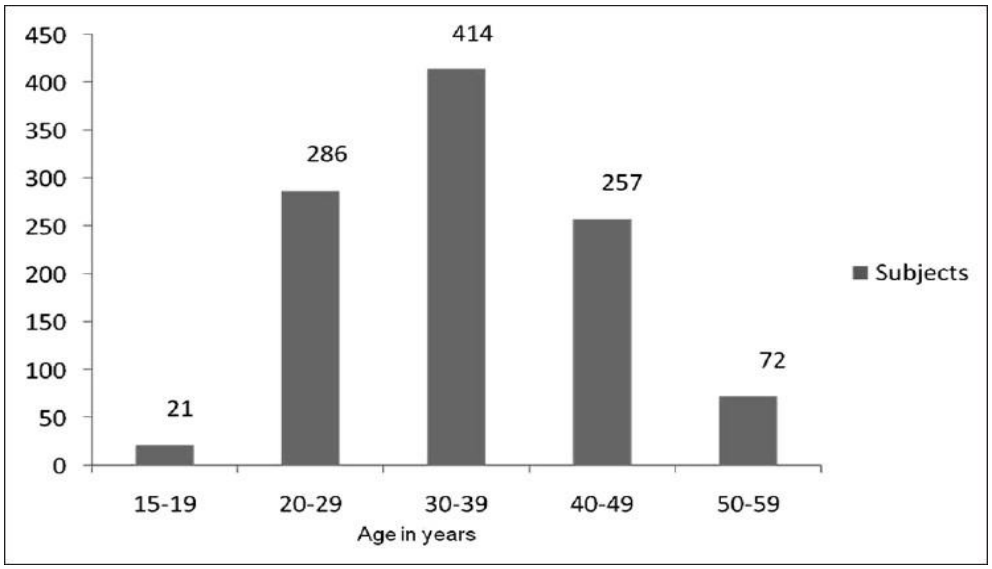


Figure 4: Distribution of subjects in the different age groups

Mean age of respondents was 35.1 ± 8.7 years (range: 16-55 years) with the majority in the third to fifth decade [Figure 4].

Variables	N = 1050
Mean age (range) years	35.14 ± 8.73 (16-55)
Male: female	612:438 (29:21)
Residence	
Urban	49%
Rural	41.4%
Town	9.6%
Educational status	
Illiterate	19.6%
Primary	10.4%
Secondary	23.1%
High school	20.9%
Pre-university	11%
Vocational	3.9%
Graduate	9%
Postgraduate	0.9%
Professional	1.3%
Marital status	
Married	82.6%
Unmarried	13.3%
Widowed	2.6%
Separated	1.5%

Table 1: Demographic characteristics of the study population

Male to female distribution was 29:21. There was a fair representation of different occupations: Professionals (1%), semi-professionals (23%), skilled

workers (22.5%), semi-skilled workers (1.6%), unskilled workers (21.3%), housewives (27.5%), unemployed (0.2%), students (2.7%) and retired individuals (0.3%) [Table 1].

Insomnia is more common among women, middle-aged and older adults, shift workers, and patients with medical or psychiatric disorders. Persistent insomnia can produce an important burden for the individual and for society, as evidenced by reduced quality of life, impaired daytime functioning and increased absenteeism at work, and higher health-care costs. Persistent insomnia is also associated with increased risks of depression and chronic use of hypnotics.[11-14]

As stated in a 2005 US National Institutes of Health State of the Science Statement on Manifestations and Management of Chronic Insomnia in Adults[15] Population-based studies suggest that about 30 per cent of the general population complains of sleep disruption, while approximately 10 per cent has associated symptoms of daytime functional impairment consistent with the diagnosis of insomnia, though it is unclear what proportion of that 10 per cent suffers from chronic insomnia. Not surprisingly, higher prevalence rates are found in clinical practices, where about one-half of respondents report symptoms of sleep disruption.

Chronic insomnia does not typically resolve spontaneously, although the presenting form of insomnia (i.e., initial, middle, or late) can vary over time[16]. For instance, subjects in one study presented with an average chronicity of 10 yr at their initial assessment and 88 percent continued to report insomnia 5 yr later[17]. Insomnia is also a highly co-morbid condition and appears more

frequently as a co-morbid illness than as primary insomnia[18]. The day-today cost of insomnia is not limited to fitful sleep. Insomnia, when chronic, tends to be unremitting, disabling, costly, and may pose a risk for additional medical and psychiatric disorders

3.3 TYPES OF INSOMNIA

There are two types of insomnia

- Primary insomnia
- Secondary insomnia.

Primary insomnia means that a person is having sleep problems that are not directly associated with any other health condition or problem.

Secondary insomnia means that a person is having sleep problems because of something else, such as a health condition (like asthma, depression, arthritis, cancer, or heartburn); pain; medication they are taking; or a substance they are using (like alcohol). [19]

3.3.1 Primary Insomnia

Primary insomnia, simply called insomnia (or chronic insomnia), is a common sleep disorder that affects most adults at some point in their lives. People with insomnia typically have trouble falling asleep or staying asleep. In some cases, you may fall asleep quickly, but wake up several times throughout the night. [19]

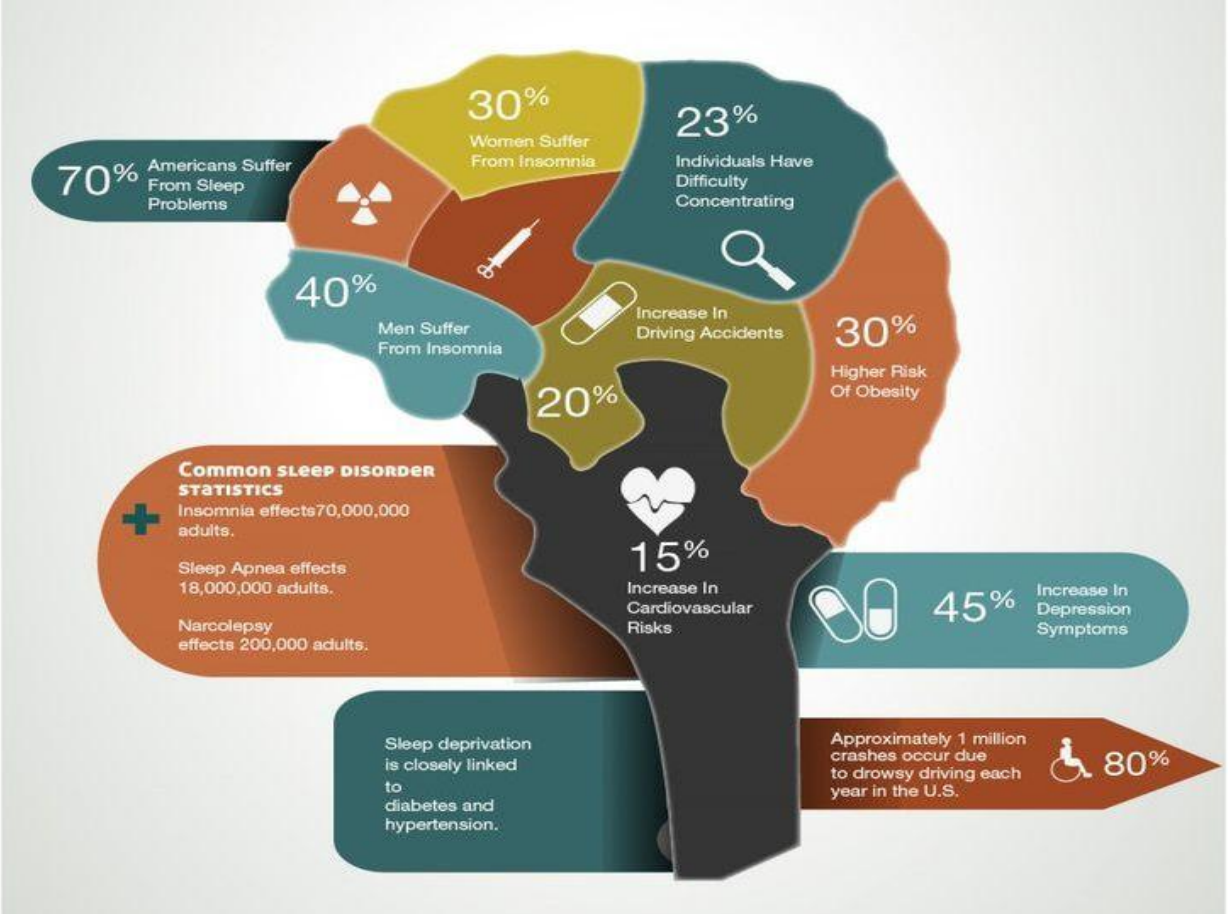


Figure: 5: Insomnia facts and dangers

3.3.2 Causes of insomnia

a. Going to bed at different times each night

b. Working the night or graveyard shift

c. Sleeping with your television or radio on

d. Not getting enough exercise or physical activity

e. Consuming too much caffeine

f. Ingesting alcohol or medication containing caffeine

g. Smoking

h. Psychological stress or worry

i. Physical pain

j. Mental health disorders, such as depression or anxiety

3.3.3 Symptoms of Primary Insomnia

Adults need at least seven to eight hours of sleep each night. If you have insomnia, it can take you 30 minutes or more to fall asleep. In addition, you may only sleep for a few hours at a time.

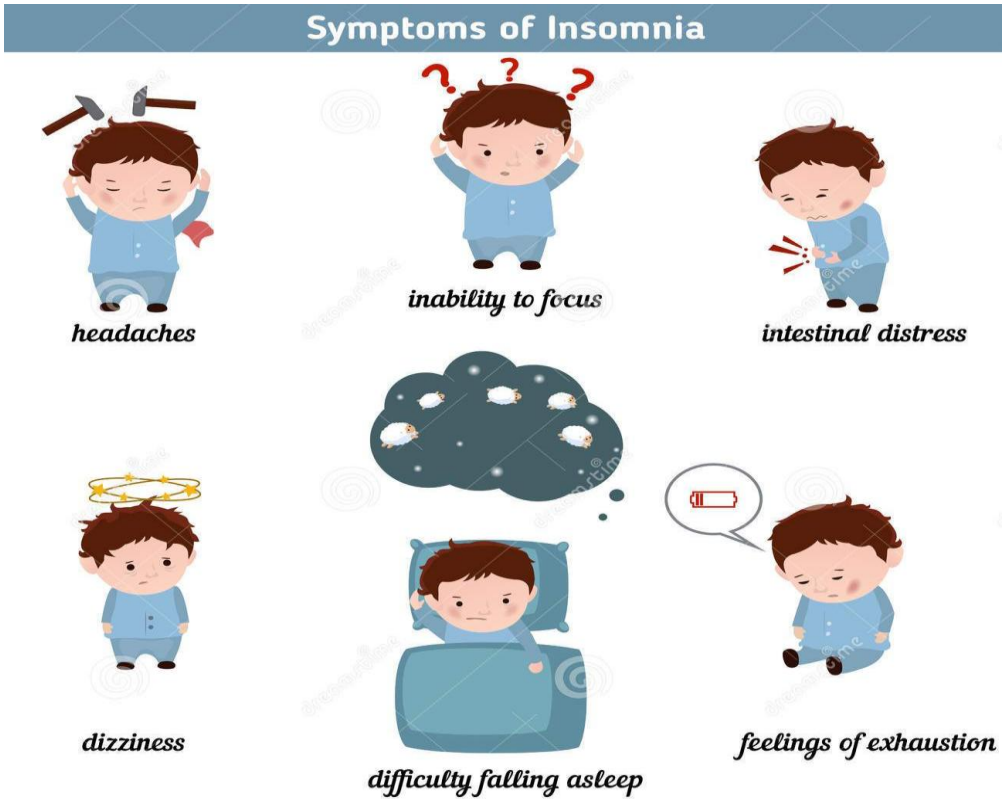


Figure 6: Symptoms of Primary Insomnia

3.3.4 Other common symptoms of primary insomnia include:

Sleepiness during the day, trouble concentrating, tension headaches, constantly worrying about sleep, generalized anxiety not feeling refreshed in the morning.

Difficulty initiating and maintaining sleep (DIMS): A broad term that includes insomnia with any of the subtypes described below.[21]

1. Idiopathic insomnia: Lifelong insomnia with a presumed organic component.

2. Inadequate sleep hygiene insomnia: A form of insomnia that is conceptualized as being perpetuated, in large measure, by lifestyle issues.
3. Initial insomnia: Difficulty falling asleep in the absence of middle or late insomnia (also referred to as sleep onset insomnia).
4. Insomnia not otherwise specified (NOS): A form of insomnia that is conceptualized as being perpetuated by unknown factors.
5. Late insomnia: Difficulty with early morning awakenings in the absence of initial or middle insomnia (also referred to as terminal insomnia or sleep offset insomnia).
6. Middle insomnia: Difficulty maintaining sleep in the absence of initial or late insomnia (also referred to as sleep maintenance insomnia).
7. Paradoxical insomnia: A form of insomnia for which there is a profound discrepancy between the patient's experience of sleep continuity disturbance and the measure of insomnia severity by polysomnography.
8. Physiological insomnia: A form of insomnia that is conceptualized as being perpetuated, in large measure, by organic factors.
9. Psycho physiologic insomnia: A form of insomnia that is conceptualized as being perpetuated by both psychological (behavioral and cognitive) and physiological factors[22]

3.4 Evaluation of Insomnia

3.4.1 Sleep History

The evaluation of insomnia rests on a careful clinical history. The clinician should evaluate the nature, frequency, and duration of insomnia symptoms, their

chronology, and response to treatment. The patient's symptoms should be considered across the entire 24-hour day: Sleep and wakefulness affect each other in complex ways, and patients often seek treatment because of daytime symptoms and distress related to their sleep problems[24]. Key elements of the sleep history include:

- Temporal aspects of sleep: Times at which patient goes to bed, attempts to sleep, wakes up, gets out of bed
- Quantitative aspects of sleep: Sleep latency (time it takes to fall asleep); number and duration of awakenings; wakefulness after sleep onset; total sleep time
- Qualitative aspects of sleep: Subjective sleep quality, satisfaction
- Behavioural and environmental factors: Non-sleep activities in bed (phone, computer, TV); environment (temperature, light, sound); bed partners and pets; perceived causes of awakening
- Symptoms of other sleep disorders: Obstructive sleep apnea (snoring, breathing pauses); restless legs syndrome (urge to move the extremities); parasomnias (unusual sleep behaviours); circadian rhythm disorders (unusual sleep timing)
- Daytime causes and consequences of disturbed sleep: Napping; exercise; work and activities; social and family stressors; use of caffeine, alcohol, and tobacco
- Medical and psychiatric history Insomnia evaluation should include a medical/ psychiatric history and physical examination to identify co morbid conditions that can exacerbate, or be exacerbated by, insomnia.

- Medical disorders: Neurologic (stroke, migraine); Pulmonary (COPD, asthma); Chronic pain (arthritis, fibromyalgia); Endocrine (hypo-, hyperthyroidism); Gastroespohageal reflux; Cardiovascular (CHF)
- Psychiatric disorders: Depression; Bipolar disorder; Anxiety disorders; Substance use disorders
- Medications: Antidepressants; other sedatives; antihypertensive; steroids; decongestants and antihistamines; adrenergic agonists[23]

3.4.2Other tools and tests

- Sleep-wake diary: Prospective record of sleep-wake timing, quantity, and quality; may identify patterns that are useful targets for behavioural treatment
- Wrist actigraphy: Measure and store movement data for up to 28 days; rest-activity patterns correlate with sleep-wakefulness
- Polysomnography (sleep study): Not recommended for routine assessment of insomnia, but appropriate to evaluate suspected sleep apnea or parasomnias

The differential diagnosis of insomnia includes other sleep and medical disorders[24]. Up to 50% of adults with obstructive sleep apnea (OSA) also complain of insomnia. The presence of loud snoring, witnessed apnoeas, obesity, and narrow upper airway all suggest OSA. Circadian rhythm sleep disorders, such as delayed sleep phase disorder and shift work disorder, include symptoms of difficulty falling asleep or waking too early.

Abnormal sleep timing, i.e., going to bed and waking at very late times, distinguish these conditions from insomnia disorder. Restless legs syndrome

often results in difficulty falling asleep, but is accompanied by an urge to move the extremities and dysesthesias. A separate insomnia diagnosis is not needed for all patients with medical, psychiatric, or other sleep disorders who have insomnia symptoms, and should be made only if the symptoms are severe or constitute an independent focus of clinical attention.[24]

3.5 Treatments

Insomnia treatment includes two broad categories: Cognitive-behavioural treatments and medication treatment. Patients often prefer non-pharmacologic approaches,[25] but two-thirds of patients taking hypnotics report at least moderate satisfaction.[21] Patients often try self-help strategies including reading, relaxation, and "sleep hygiene," and over-the-counter remedies such as alcohol, antihistamines, and herbal preparations.

3.6 PATHOPHYSIOLOGY

Physiologic perspectives hyper arousal, circadian dysarithmia, and homeostatic dysregulation of sleep are each thought to contribute to the occurrence of insomnia. The largest body of work exists for hyper arousal conceptualized as .either elevated basal levels or as a failure to down-regulate at night and further construed along somatic/physiologic, cognitive, and cortical/ neurophysiologic dimensions.[24] In terms of physiologic arousal, patients with insomnia have been shown to have elevations of heart rate, galvanic skin response, sympathetic arousal (as measured by heart rate variability), and increased hypothalamic-pituitary-adrenal (HPA) axis activity.[24]

In terms of cognitive arousal, patients with insomnia are more prone to generalized worry, sleep-related worry, and selectively attend to and monitor insomnia symptoms. In terms of cortical/neurophysiologic arousal patients with insomnia exhibit increased high frequency EEG activity at or around sleep onset and during non-rapid eye movement (REM) sleep[24], elevated whole brain metabolism across waking and non-REM sleep[26], and smaller metabolic declines than normal in the ascending reticular activating system, in the hippocampus, the amygdala and anterior cingulated cortex during the wake to sleep transition[25]. Overall, there is a fairly large body of evidence that supports an association between hyper arousal and insomnia.

Given the relative dearth of information regarding the eti- ology and pathophysiology regarding insomnia types, it should come as no surprise that there are also little to no data that show how the insomnia subtypes differ with respect to genetic and/or biological factors, regulation of the circadian and sleep homeostasis systems, and/or the functioning of the neural circuitry of sleep and/or wake control.

This said, extreme forms of initial and terminal insomnia have been exhaustively researched as independent disorders of the circadian system. Specifically, delayed sleep phase disorder (corresponding to initial insomnia) and advanced sleep phase disorder (corresponding to terminal insomnia). In these cases, the pathogenesis of the disorders are thought to be related to differences in the circadian control of sleep and wakefulness and there is behavioural and molecular genetics research to suggest that

these disorders are heritable and are related to specific gene alterations. For specifics regarding delayed sleep phase disorder and advanced sleep phase disorder, the reader is referred to the articles in this text that specifically define these disorders.[22]

3.7 COMPLICATIONS:

Insomnia can increase your risk for mental health problems as well as overall health concerns.[22]

1. Increased risk for medical conditions

- Stroke
- Asthma Attacks
- Seizures
- Weak Immune System
- Sensitivity To Pain
- Inflammation
- Obesity
- Diabetes Mellitus
- High Blood Pressure
- Heart Disease

2. Increased risk for mental health disorders

- Depression
- Anxiety
- Confusion and frustration

3. Increased risk for accidents

- Insomnia can affect your:

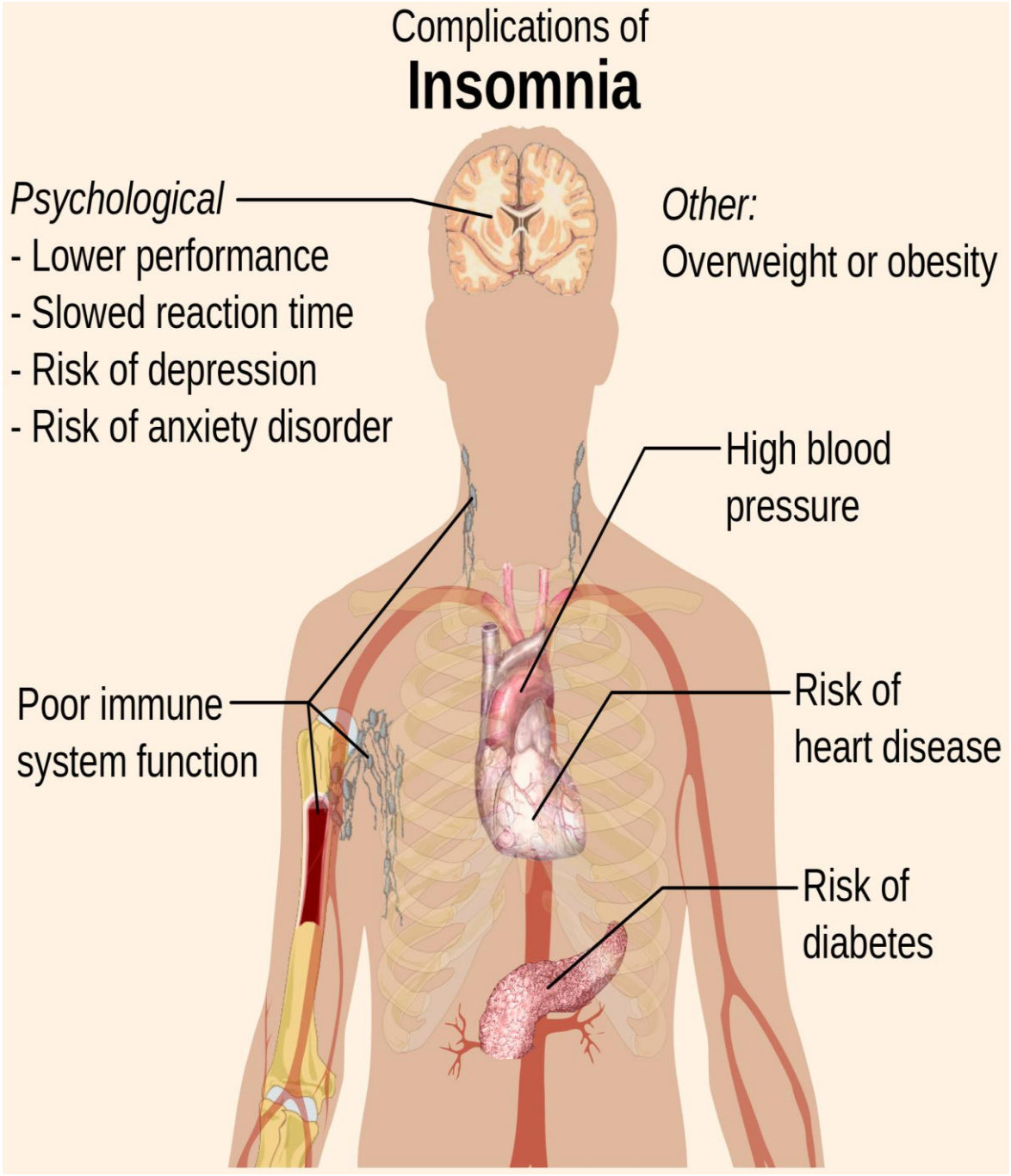


Figure 7: Complications of Insomnia

- Performance at work or school
- Sex drive

- Memory
- Judgement[22]

4. Shortened life expectancy

Having insomnia can shorten your life expectancy. An analysis of 16 studies that covered over 1 million participants and 112,566 deaths looked at the correlation between sleep duration and mortality. They found that sleeping less increased risk for death by 12 percent, compared to those who slept seven to eight hours per night.

A more recent study looked at the effects of persistent insomnia and mortality over 38 years. They found that those with persistent insomnia had a 97 percent increased risk of death.[21]

3.8 CURRENT INTERVENTION

As a continuing theme of this review, there is no evidence that any type or subtype of insomnia is differentially responsive to one or more treatment types. This said, a general overview of treatment approaches is provided below.[27] Medications commonly used for sleep Flurazepam, Temazepam Triazolam Estazolam Zolpidem Quazepam, Zaleplon, Eszopiclone

3.8.1 Cognitive behavioral approaches

The primary cognitive behavioral treatment of insomnia (CBT-I) is a multicomponent behavioral therapy that usually comprises three core treatments: stimulus control, sleeps restriction, and sleep hygiene therapies. Interestingly, and despite the ‘C’ in CBT-I, it is often the case that formal cognitive therapy is not part of the CBT-I intervention.

3.8.2 Cognitive-behavioral treatments

Maladaptive behaviors, thoughts, and beliefs regarding sleep can serve as perpetuating factors for insomnia disorders, and are the targets of cognitive and behavioral treatments. These treatments include several common elements: The use of sleep diaries to identify baseline patterns and clinical changes; the importance of patient investment in changing behaviors; and the use of voluntary waking behaviors to influence sleep, which is a largely involuntary process. Behavioral treatments are indicated for primary and co morbid insomnia[27].

3.8.3 Stimulus control therapy

Stimulus control instructions

- Restrict the behaviors that occur in the bedroom to sleep and sex.
- Limit the amount of time patients spend awake in bed or the bedroom, and
- Promote counter conditioning by insuring the bed and bed environment are tightly coupled with sleepiness and sleep.

3.8.4 Sleep restriction

Sleep restriction therapy (SRT) requires patients to limit the amount of time they spend in bed to an amount equal to their average total sleep time (TST). When sleep proves to be efficient, TST is incrementally increased.

3.8.5 Sleep hygiene

This intervention requires that the clinician and patient review a set of instructions which are geared toward helping the patient maintain good sleep habits. Sleep hygiene instructions, it should be noted, are not helpful when provided as a monotherapy.[27]

3.8.6 MAPs for Daily Living

A certified teacher with more than 20 years of mindfulness practice will deliver the formalized program curriculum. Mindfulness exercises included mindful sitting meditation, mindful eating, appreciation meditation, friendly or loving-kindness meditation, mindful walking, and mindful movement. Participants engage in a mean of 10 to 30 minutes of mindful experiential practice.[28]

3.8.7 SHE program

The SHE program was selected as a highly active control group to account for nonspecific effects (e.g., time, attention, teacher, and group support) and participant or staff expectancy of a benefit on sleep. A trained health educator who held an MPH degree in health education delivered the program curriculum to participants.

Active components included knowledge of sleep biology, characteristics of healthy and unhealthy sleep, sleep problems, stress biology and stress reduction, self-monitoring of sleep behavior, relaxation methods for improving sleep, and weekly behavioral sleep hygiene strategies. The SHE educational and behavioral content is based on National Institutes of Health39 and National Sleep

Foundation 40 tips for better sleep (e.g., changing poor sleep habits and establishing a bedtime routine).[29-30]

3.9 HISTORY OF YOGA

Sage patanjali is the Father of yoga and he is the compiler of the Yoga sutras, a text on Yoga theory and practice and a notable scholar of Samkhya school of Hindu philosophy

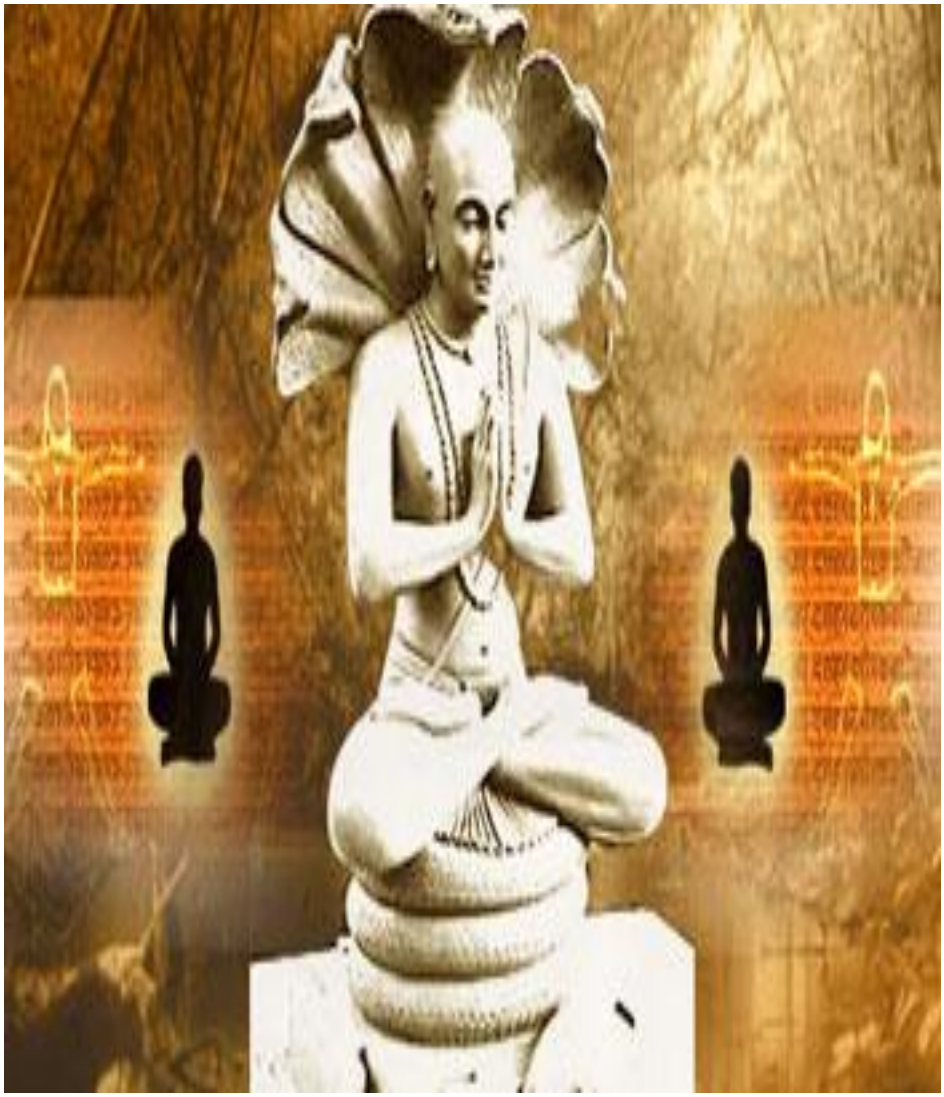


Figure 8: Maharishi Patanjali

Pantanjali is also said to be an incarnation of Adi Sesha who is the first ego-expansion of Vishnu, Sankarshana. Pantanjali is worshiped by the dancers of

India as their patron saint. However, Pantanjali's reputation as a great dancer is doubted by scholars who know him as the author of the famous Sutras. It is said that once while watching a dance by Lord Shiva, Adi Shesha found it unbearable to support the weight of Lord Vishnu

Pantanjali was born to Atri and Anusuya; both masters of Ashtanga yoga. The details surrounding his birth have assumed mythical dimensions. It is said that in order to teach yoga, Pantanjali fell from the heavens in the form of a little snake, and fell into his virginal mother's open palms.[31]

His most known accomplishment is the compilation of the Yoga Sutras, a major work which contains aphorisms on the philosophical aspects of mind and consciousness, and is the assumed writer of work on the ancient Indian medicine system. Recently Yoga Sutra has become popular worldwide for the precepts of Raja Yoga, and also the philosophical basis of the Yoga movement, which aids in the health of harmonizing of the body mind.

Patanjali's ashtanga yoga includes eight components of practice ("ashtanga" means "eight-limbed" in Sanskrit), and dharana, or concentration is the sixth of these eight limbs. The seventh limb is dhyana, or meditation, and the eighth and final limb is samadhi, or enlightenment.[3]

Patañjali divided his Yoga Sutras into four chapters (Sanskrit pada), containing in all 196 aphorisms, divided as follows: [3]

3.9.1 Samadhi Pada[3] (51 sutras).

Samadhi refers to a state of direct and reliable perception (pramāṇa) where the yogi's self-identity is absorbed into the object meditated upon, collapsing the categories of witness, witnessing, and witnessed.

This chapter contains the famous definitional verse: "Yogaś citta-vritti-nirodhaḥ" ("Yoga is the restraint of mental modifications").3

3.9.2 Sadhana Pada[3] (55 sutras).

Sadhana is the Sanskrit word for "practice" or "discipline". it consists of two forms of Yoga: Kriyā Yoga and Ashtanga Yoga (Eightfold or Eight limbed Yoga).

Kriyā Yoga in the Yoga Sūtras is the practice of three of the Niyamas of Aṣṭāṅga Yoga: tapas, svādhyaya, and iśvara praṇidhana – austerity, self-study, and devotion to god. Aṣṭāṅga Yoga is the yoga of eight limbs: Yama, Niyama, Āsana, Prāṇāyāma, Pratyahara, Dhāraṇa, Dhyāna, and Samādhi.

3.9.3 Vibhuti Pada[32, 33] (56 sutras).

Vibhuti is the Sanskrit word for "power" or "manifestation". 'Supra-normal powers' (Sanskrit: siddhi) are acquired by the practice of yoga. Combined simultaneous practice of Dhāraṇā, Dhyana and Samādhi is referred to as Samyama, and is considered a tool of achieving various perfections, or Siddhis.

3.9.4 Kaivalya Pada[32, 33] (34 sutras).

Kaivalya literally translates to "isolation", but as used in the Sutras stands for emancipation or liberation and is used where other texts often employ the term

moksha (liberation). The Kaivalya Pada describes the process of liberation and the reality of the transcendental ego.

3.9.5 Ashtanga, the eight components of yoga

Patanjali defines yoga as having eight components[2] (astanga, "eight limbs") The eight limbs of yoga are

- yama (abstinences),
- niyama (observances),
- asana (yoga postures),
- pranayama (breath control),
- pratyahara (withdrawal of the senses),
- dharana (concentration),
- dhyana (meditation) and
- samadhi (absorption)."[2]

1. Yamas

Yamas are ethical rules in Hinduism and can be thought of as moral imperatives. The five yamas listed by Patañjali in Yogasūtra 2.30 are:

1. Ahiṃsā (अहिंसा): Nonviolence, non-harming other living beings[2]
2. Satya (सत्य): truthfulness, non-falsehood
3. Asteya (अस्तेय): non-stealing
4. Brahmacarya (ब्रह्मचर्य): sexual restraint
5. Aparigraha (अपरिग्रह): non-possessiveness

2. Niyama

The second component of Patanjali's Yoga path is called niyama, which includes virtuous habits, behaviours and observances (the "dos").

1. Śaucha: purity, clearness of mind, speech and body
2. Santoṣa: contentment
3. Tapas: austerity
4. Svādhyāya: introspection of self's thoughts,
5. Īśvarapraṇidhāna: contemplation of the Ishvara (God/Supreme Being, Brahman, True Self.

3.Āsana

स्थिरसुखमासनम् ॥४६॥

An asana is what is steady and pleasant.[49]

Motionless and Agreeable form (of staying) is Asana

— Yoga Sutras II.46[2]

Asana is thus a posture that one can hold for a period of time, staying relaxed, steady, comfortable and motionless. "Posture one can hold with comfort and motionlessness".[34] Asanas are perfected over time by relaxation of effort with meditation on the infinite"; this combination and practice stops the quivering of body.[35] The posture that causes pain or restlessness is not a yogic posture. Other

secondary texts studying Patanjali's sutra state that one requirement of correct posture is to keep chest, neck and head erect (proper spinal posture).[35]

4. Prānāyāma

Prāṇāyāma is made out of two Sanskrit words prāṇa (प्राण, breath) and āyāma (आयाम, restraining or stretching). prāṇāyāma, which is the practice of consciously regulating breath (inhalation and exhalation).[35] This is done in several ways, inhaling and then suspending exhalation for a period, exhaling and then suspending inhalation for a period, slowing the inhalation and exhalation, consciously changing the time/length of breath (deep, short breathing).[36]

5. Pratyāhāra

Pratyāhāra is a combination of two Sanskrit words prati- (the prefix प्रति-, "against" or "contra") and āhāra (आहार, "bring near, fetch").[35]

Pratyahara is drawing within one's awareness. It is a process of retracting the sensory experience from external objects. It is a step of self extraction and abstraction.Pratyahara is not consciously closing one's eyes to the sensory world, it is consciously closing one's mind processes to the sensory world.

Pratyahara empowers one to stop being controlled by the external world, fetch one's attention to seek self-knowledge and experience the freedom innate in one's inner world.

6. Dhāraṇā

Dharana :sanskrit - धारणा means concentration, introspective focus and one-pointedness of mind. The root of word is dhṛ (धृ), which has a meaning of "to

hold, maintain, keep".[35]Dharana as the sixth limb of yoga, is holding one's mind onto a particular inner state, subject or topic of one's mind. The mind is fixed on a mantra, or one's breath/navel/tip of tongue/any place, or an object one wants to observe, or a concept/idea in one's mind.[67][68] Fixing the mind means one-pointed focus, without drifting of mind, and without jumping from one topic to another.[35]

7. Dhyāna

Dhyana (Sanskrit: ध्यान) literally means "contemplation, reflection" and "profound, abstract meditation". Dhyana is contemplating, reflecting on whatever Dharana has focused on. If in the sixth limb of yoga one focused on a personal deity, Dhyana is its contemplation.

If the concentration was on one object, Dhyana is non-judgmental, non-presumptuous observation of that object. If the focus was on a concept/idea, Dhyana is contemplating that concept/idea in all its aspects, forms and consequences. Dhyana is uninterrupted train of thought, current of cognition, flow of awareness.[34]

Dhyana is integrally related to Dharana, one leads to other. Dharana is a state of mind, Dhyana the process of mind. Dhyana is distinct from Dharana in that the meditator becomes actively engaged with its focus. Patanjali defines contemplation (Dhyana) as the mind process, where the mind is fixed on something, and then there is "a course of uniform modification of knowledge".[36]

Adi Shankara, in his commentary on Yoga Sutras, distinguishes Dhyana from Dharana, by explaining Dhyana as the yoga state when there is only the

"stream of continuous thought about the object, uninterrupted by other thoughts of different kind for the same object"; Dharana, states Shankara, is focussed on one object, but aware of its many aspects and ideas about the same object.

8. Samādhi

Samadhi (Sanskrit: समाधि) literally means "putting together, joining, combining with, union, harmonious whole, trance".[2] Samadhi is oneness with the subject of meditation. There is no distinction, during the eighth limb of yoga, between the actor of meditation, the act of meditation and the subject of meditation. Samadhi is that spiritual state when one's mind is so absorbed in whatever it is contemplating on, that the mind loses the sense of its own identity. The thinker, the thought process and the thought fuse with the subject of thought. There is only oneness, samadhi.[35]

According to yogic point of view insomnia is mainly caused due to the imbalance in the manomaya kosha. The practice of chakra meditation influences through manomaya kosha to annamaya kosha. The chakra meditation improves the pranic energy level and its distributes the energy to the whole body. By balancing the pranic energy level so that the manomaya kosha gets awakened.ida and pingala which represents the sympathetic and parasympathetic system which gets activated and the mind becomes strong and activated.[2]

3.10 MEDITATION:

Meditation practices have been a life style practiced in India thousands of years ago. Proficient meditative practices help to integrate the brain functions, regulate various physiological mechanisms resulting in a state of mental and

physical well being.

Intense meditation practices help to achieve a harmony between body and mind. Meditation practices influence brain functions, induce various intrinsic neural plasticity events, modulate autonomic, metabolic, endocrine, and immune functions and thus mediate global regulatory changes in various behavioral states including sleep. This brief review focuses on the effect of meditation as a self regulatory phenomenon on sleep.

The study conducted on the effect of meditation on sleep[37] in practitioners of TM. The main objective was to evaluate the neurophysiologic correlates of the higher states of consciousness during sleep.

The study reported that the senior meditators spent more time in the slow wave sleep (SWS) with higher theta–alpha power with background delta activity, together with reduced electromyogram (EMG). The rapid eye movement (REM) sleep was also found to be enhanced. The distinct theta–alpha pattern observed during sleep was considered as an electrophysiological correlate of a stabilized state of higher consciousness in sleep. Further, the study opened up new avenues to explore the influence of meditation on sleep.[37]

The study reported that the Meditation practices were reported to regulate the hypothalamopituitary adrenal (HPA) Axis and thereby the cortisol and catecholamine levels [37,38]and also melatonin level.[40, 41]

The Study of long term transcendental meditation (TM) practitioners have shown that TM helped to achieve a statue of “restful alertness” a state of deep physiological rest which was associated with periods of respiratory suspension

without compensatory hyperventilation, decreased heart rate, heightened galvanic skin response along with enhanced wakefulness. This restful alertness and hypo metabolic state were believed to be the outcome of physiological and biochemical changes brought about by meditation practices[42]

A study reported that the Melatonin plays a vital role in the physiological regulation of sleep in both blind and normal individuals[43]Melatonin is widely used in the management of sleep rhythm disorders due to jetlag, shift work, and insomnia[44]

A study conducted and demonstrated the differences in sleep architecture in practitioners of Vipassana meditation (mindfulness meditation). The sleep architecture of senior practitioners of Vipassana meditation was endowed with enhanced states of SWS and REM sleep compared to that of non-meditating control group.[45,46]

Vipassana meditation also enhanced the REM sleep states. Meditation practices are reported to enhance the amplitude of gamma synchrony, strengthen the thalamo-cortical and cortico-cortical interactions[47].

These mechanisms brought about stronger network synchronization and altered the neural structure and functions [48]. Based on the above observations, the changes in sleep architecture in the Vipassana meditation practitioners could be attributed to the neural plasticity events associated with meditation.

Based on the above observations, the changes in sleep architecture in the Vipassana meditation practitioners could be attributed to the neural plasticity events associated with meditation.

Reduced parasympathetic activity along with inefficient baroreflex mechanisms during REM sleep have been reported to cause unfavourable cardiac events.[49, 50, 51] Meditation practices are associated with enhanced frontal midline theta activity.[52, 53]

The frontal midline theta activity originates from the anterior cingulated cortex and controls the parasympathetic activity[54]. Vipassana meditation practices would have activated the anterior cingulated cortex and hence modulated the parasympathetic activity during sleep. These reports are suggestive of a positive modulator role of meditation in sleep through autonomic functions.

In addition to its role in sleep, melatonin acts as an antioxidant and immunomodulator, [55] oncostatic, antiaging agent, and helps in bringing sense of wellbeing [55,56,57] Aging attenuates the melatonin secretion [58] and hence affect the sleep quality in aged population.

Meditation practices are reported to enhance the melatonin levels [41], the precursors of melatonin especially the serotonin [59] and noradrenalin.[60] Meditation increases melatonin concentration by slowing its hepatic metabolism or augmenting the synthesis in the pineal gland[40]. Diurnal melatonin levels were found to be significantly high in Vipassana meditators (approximately 300 pg ml) than non-meditating controls (65 pg ml; unpublished data). By considering the role of melatonin in sleep maintenance, it might be concluded that meditation practices enhance melatonin levels and hence quality of sleep.

Meditation also brings a sustained hypo metabolic state termed as relaxation response by Herbert Benson and helps in sleep initiation.[61] Meditation techniques help to regulate the blood flow to the executive regions of the brain during sleep.[62]

Meditation practices down regulate HPA axis reducing the stress, prolactin, TSH levels [63] bring about alterations in the intermediary metabolism favouring an anabolic state. Thus, meditation helps to maintain a wakeful hypo metabolic state with parasympathetic predominance[42].

Meditative practices beneficially influence the cognitive, emotional, and behavioural aspects. Thus meditation is shown to have a greater potential to influence many physiological and behavioural states including sleep.[64, 65]

Meditation practices activate structures like insula, anterior cingulate, and hypothalamus and bring about autonomic and humoral changes[66]. Meditation thus produces a continuum of global regulatory changes at various behavioural levels favouring quality sleep.

The aim is to relax and gain optimum physical benefit from yoga practices, it is necessary to concentrate on something. By directing the mind to a specific region of the body or to the breath, the effect of a particular practice is increased. Sometimes one of the chakras or psychic centres is also used as a point for spiritual concentration. On a physical level, chakras are associated with the major nerve plexuses and endocrine glands in the body.

3.11 CHAKRAS

The word chakra literally means 'wheel' or 'circle' but in the yogic context a better translation is 'vortex' or 'whirlpool'. The chakras are vortices of pranic energy at specific areas in the body which control the circulation of prana permeating the entire human structure. Each chakra is a switch which turns on or opens up specific areas of the brain. In most people these psychic centres lie dormant and inactive. Concentration on the chakras while performing yogic practices stimulates the flow of energy through the chakras and helps to activate them.[2]

This in turn awakens the dormant areas in the brain and the corresponding faculties in the psychic and mental bodies, allowing one to experience higher planes of consciousness which are normally inaccessible. The major chakras are seven in number and are located along the pathway of sushumna which flows through the centre of the spinal cord. Sushumna originates at the perineum and terminates at the top of the head.[2]

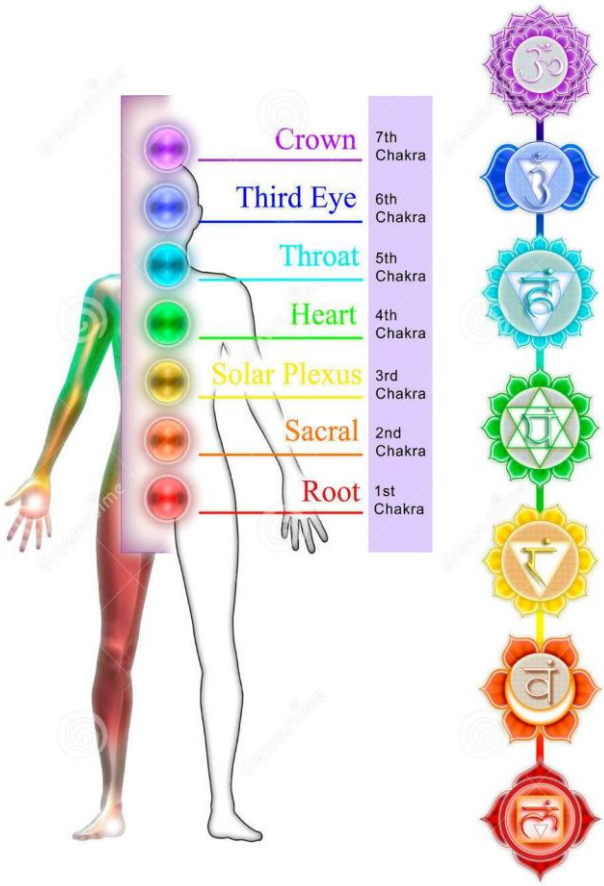


Figure 9: Human chakra system

The chakras are connected to a network of psychic channels called nadis, which correspond to the nerves but are more subtle in nature. The chakras are depicted symbolically as lotus flowers, each having a particular number of petals and a characteristic colour.

The lotus symbolises the three stages the aspirant must pass through in spiritual life: ignorance, aspiration and illumination. It represents spiritual growth from the lowest state of awareness to the highest state of consciousness.

The petals of the lotus, inscribed with the beeja mantras or seed sounds of the Sanskrit alphabet, represent the different manifestations of psychic energy connected with the chakras and the nadis or psychic channels leading into and out of them.

Within each chakra is a yantra comprised of the geometrical symbol of its associated element and beeja mantra. Within the yantra there is also a presiding deity, which represents particular aspects of divinity, along with the corresponding vahana or vehicle which is an animal form, representing other psychic aspects related with the particular centre.[2]

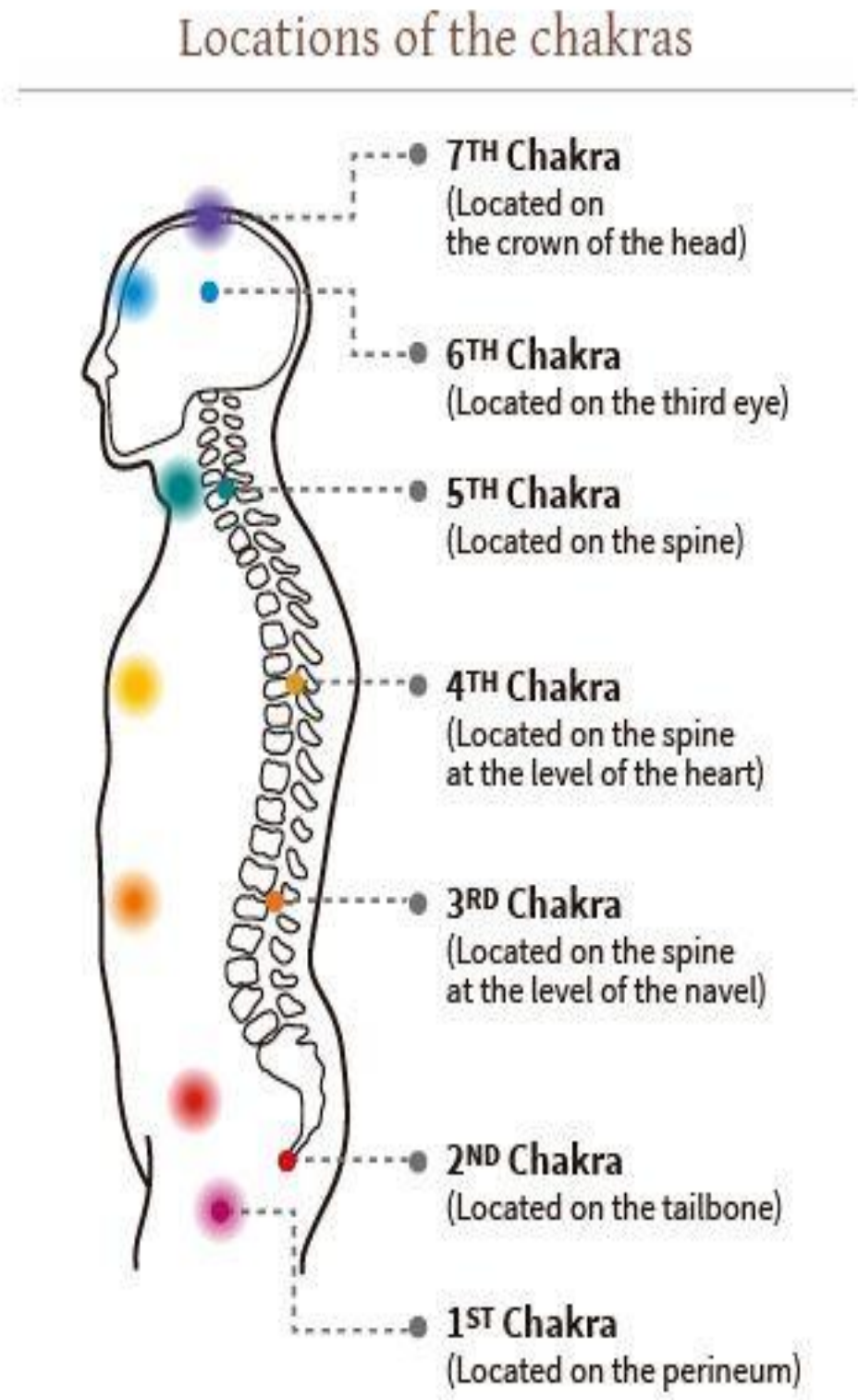


Figure 10: Location of the chakras

3.12 NADIS AND CHAKRAS:

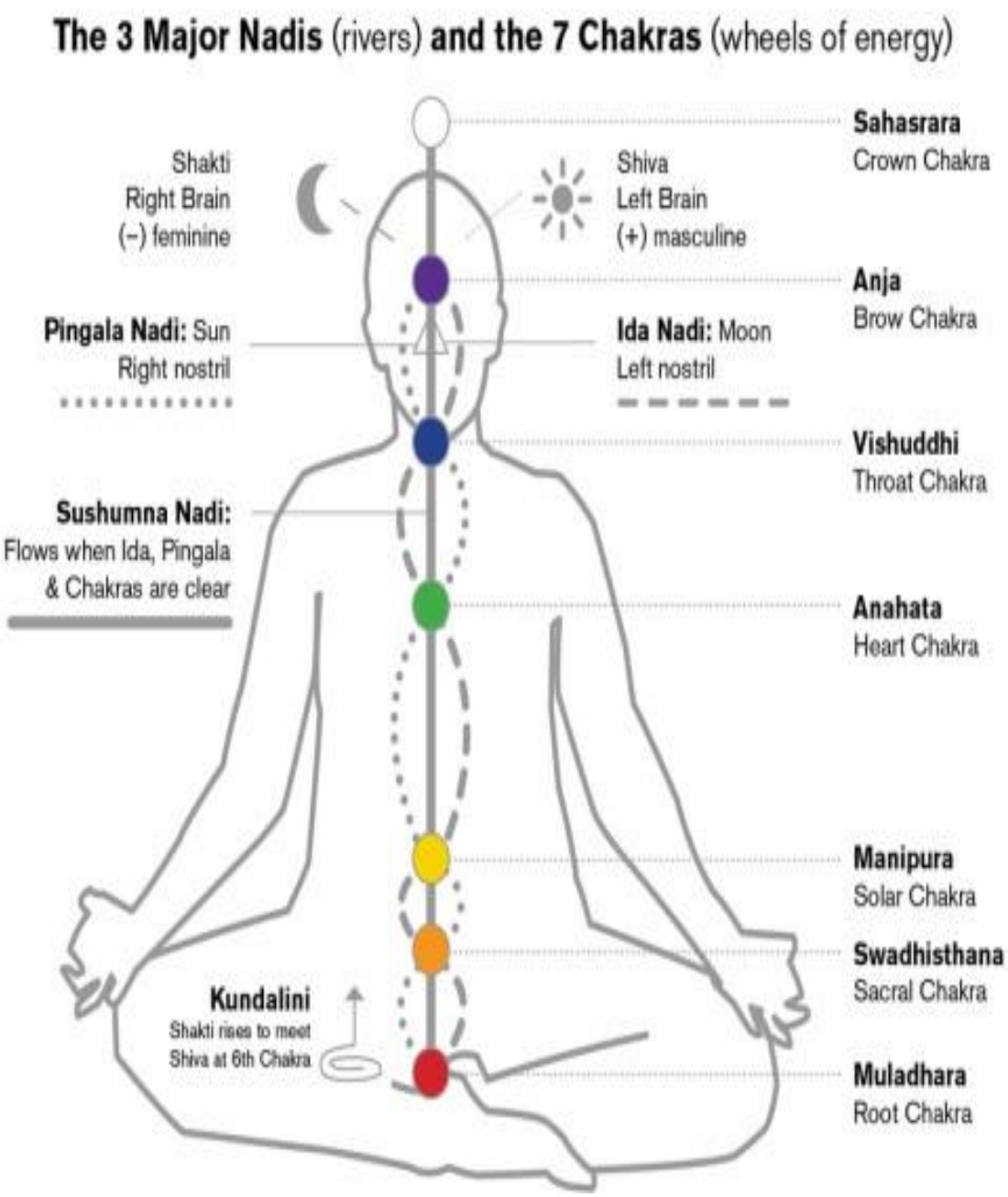


Figure 11: Nadis and chakras

3.13 AJNA CHAKRA:

Ajna chakra is situated in the midbrain, behind the eyebrow centre, at the top of the spine. it is also known as the third eye; jnana chakshu, the eye of wisdom; triveni, the confluence of three rivers; guru chakra and the Eye of Shiva. The word ajna means 'command'.[2]

Figure 12: Ajna chakra

In deeper states of meditation the disciple receives commands and guidance from the guru, and from the divine or higher self, through this chakra.Ajna chakra is depicted as a silver lotus with two petals which represent the sun and the moon or pingala, the positive force, and ida, the negative force.

These two pranic flows which are responsible for the experience of duality converge at this centre with sushumna, the spiritual force. In the centre of the lotus is the sacred beeja mantra Om. The element of this chakra is manas, mind.

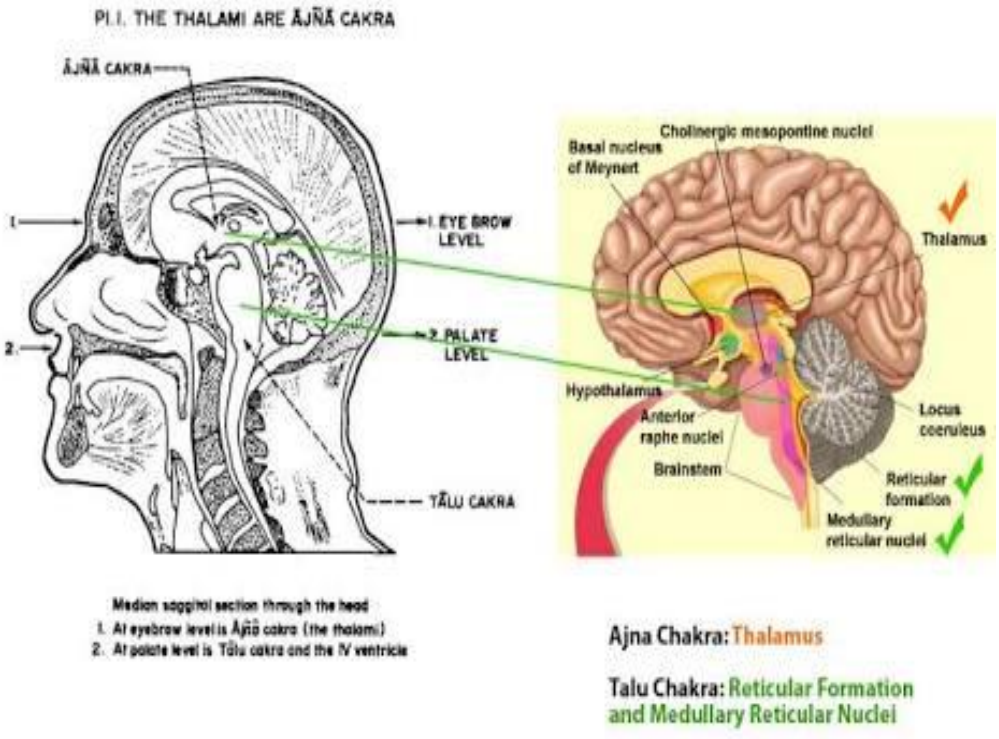


Figure 13: Physiological Relation between Ajna chakra and Pineal Gland

This is the centre where wisdom and intuition develop. When ajna is awakened, the mind becomes steady and strong, and full control over prana is gained. Ajna corresponds to the pineal gland which has almost atrophied in the adult human being. On the psychic plane this point is the bridge between the mental and psychic dimensions. Therefore, ajna chakra is responsible for supramental faculties such as clairvoyance, clairaudience and telepathy.[2]

Thought is also a very subtle form of energy. When ajna chakra is awakened, it is possible to send and receive thought transmission through this centre. It is like a psychic doorway opening into deeper and higher realms of awareness. Stimulating ajna chakra develops all the faculties of the mind, such as intelligence, memory and concentration.

3.13.1AJNA CHAKRA AND PINEAL GLAND:

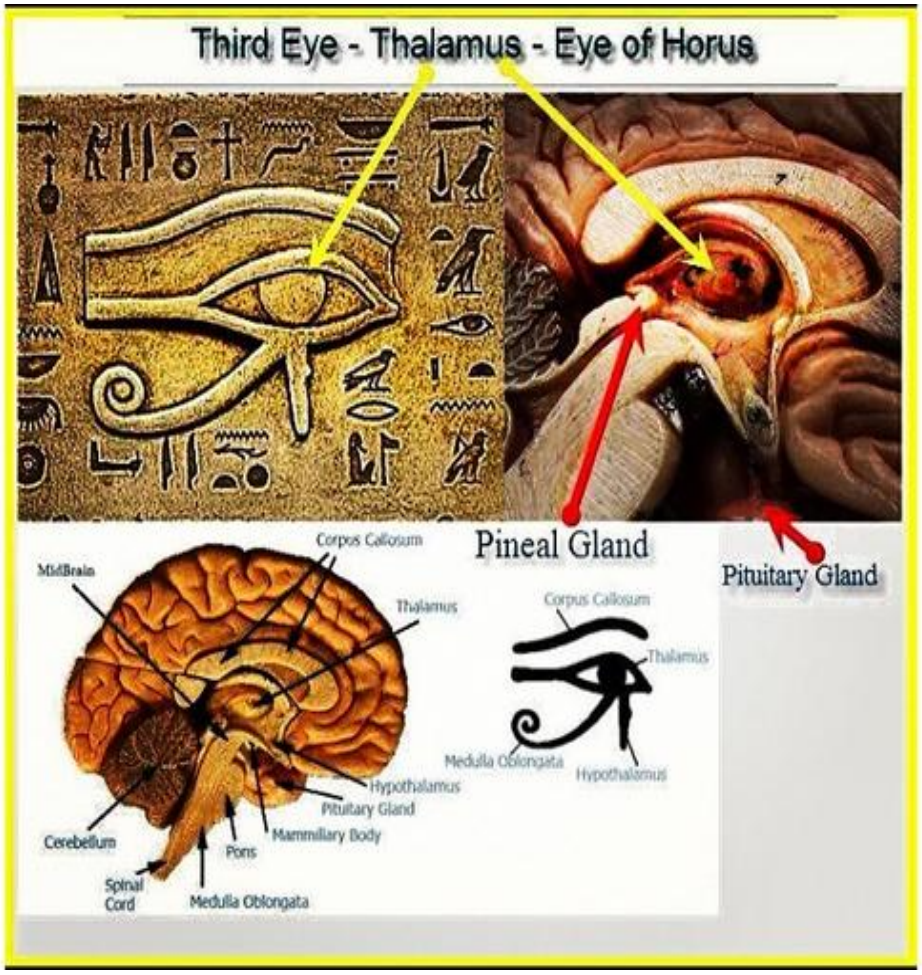


Figure 14: Third Eye and Eye of Horus

The pineal gland is known as the third eye chakra, or ajna chakra in the Hindu system. A closed ajna is said to lead to confusion, uncertainty, cynicism and pessimism. Every esoteric tradition heralded the third eye as our connection to spirit. It's the space between human and God, moving us from the isolation experienced in the human condition. Through an open and vibrant third eye, we find our highest source of ethereal energy. A return path to God is offered when one works to expand third-eye awareness.

Biologically speaking, we can see how the functions of the pineal gland contribute to a metaphysical universe. Glands by design secrete important

hormones. Melatonin is produced by the pineal gland, controlling our circadian rhythms and reproductive hormones. This makes the pineal a master regulator of time, affecting not only our sleep patterns but also our sexual maturation.

More than just sleep-regulating, the melatonin release also affects our stress and ability to adapt to a changing world. Quite simply, our happiness and well-being is directly affected by harmony in the pineal.

3.13.2 PINEAL GLAND AND NIGHT'S SLEEP

There are countless environmental, physical, mental, and emotional factors that influence our sleeping patterns on a day to day basis. When considering these various triggers, regardless of which one each person deals with each night, we can confidently say that everyone needs one, underlying element for sleep – melatonin. Let's call melatonin your sleeping secret weapon. If you had a team of hormones, melatonin would be your star player.[67, 68]

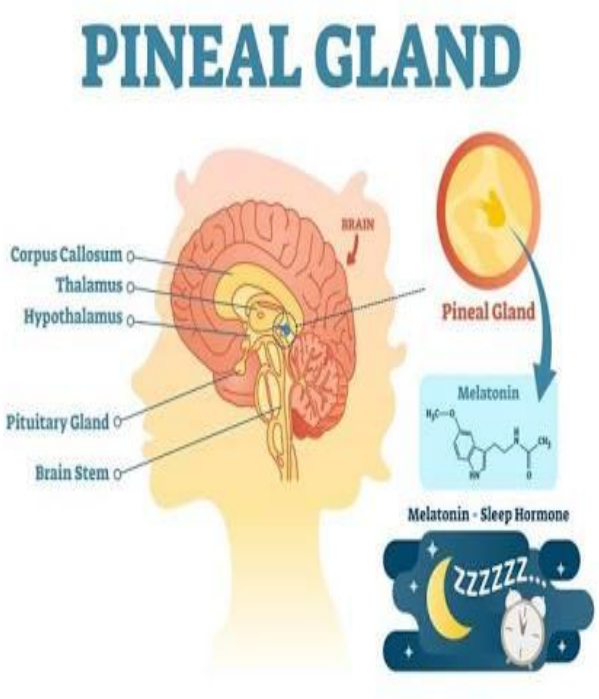


Figure 15: Physiology of pineal gland

3.13.3MELATONIN AND SLEEP :

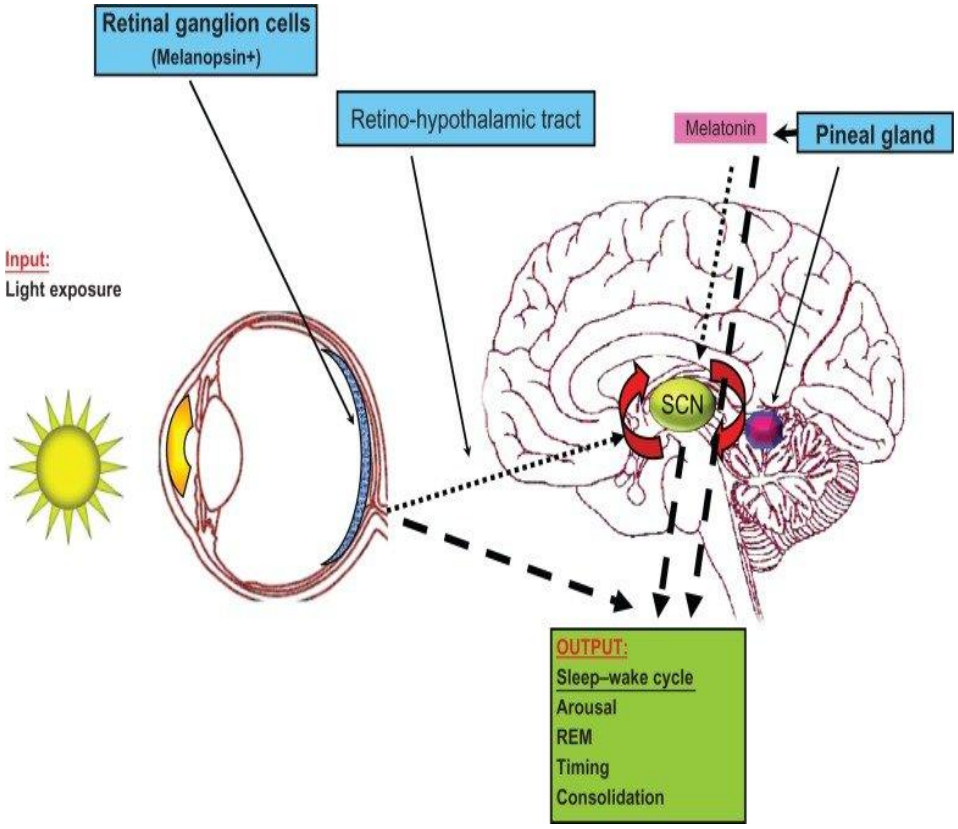


Figure 16: Physiology of melatonin

A hormone involved in sleep regulatory activity, and a tryptophan-derived neurotransmitter, which inhibits the synthesis and secretion of other neurotransmitters such as dopamine and GABA. Melatonin is synthesized from serotonin intermediate in the pineal gland and the retina where the enzyme 5-hydroxyindole-O-methyltransferase, that catalyzes the last step of synthesis, is found. This hormone binds to and activates melatonin receptors and is involved in regulating the sleep and wake cycles. In addition, melatonin possesses antioxidative and immunoregulatory properties via regulating other neurotransmitters.[69]

3.13.4AJNA CHAKRA MEDITATION:

The Ajna Chakra is the sixth chakra of the Kundalini Seven Chakra System. A chakra is an energy vortex which resides in a particular location of the body and governs the organs and glands of that region. A Chakra is also associated with certain traits and characteristics of the personality and forms a bridge between mind, body and spirit.

Ajna Chakra or Third Eye, eye lies at the very top of spine in the medulla oblongata. It relates to the pituitary gland, the pineal gland, the nasociliary nerve plexus and frontal lobes of the brain.

Chakra Meditation means to activate and balance a particular chakra, thus improving the functioning of everything in that particular region as well as refining the associated personality traits and characteristics.

Ajna Chakra literally mean “To Command”. This chakra is also called the “Third Eye” as it’s activation gives one the power of intuitive knowledge. In addition, it is called the “Guru Chakra” as its activation connects one to the “Inner Guru”.

Similarly, it is also called “Eye of Shiva” or “The Divine Eye” for its awakening implies the higher stages of meditation and wisdom. Each chakra can be activated by several means. In this meditation we will use the physical trigger point of the chakra (kshetram) as a point of concentration to activate it.

In addition, each chakra is associated with a particular seed sound (Beej Mantra) which can be utilized to awaken it.

For the Ajna Chakra the Beej Mantra is the primordial sound “OM” (AUM) and this meditation will be using that as well.

The endocrine gland for the Ajna chakra is the pineal gland, which is in the shape of a pinecone, thus it got the name pineal. It is the first gland formed in the foetus and is distinguishable at 3 weeks.

The pineal gland produces the hormone melatonin that controls the sleep patterns in the circadian rhythms and seasonal functions. It is located in the epithalamia, near the brain centre, between the two hemispheres. This gland is larger in women, thus women have better intuition than men do. The pineal gland appears to orchestrate the body's entire endocrine system.[70]

4.0 METHODOLOGY

4.1 STUDY DESIGN

Experimental study method. The total study duration of each patient is 3 months. Initial screening will be done to involve the patients meeting the requirements of inclusion criteria and selected patients will be allotted for intervention. Patients enrolled at baseline assessment were asked to record sleep diaries throughout the study period.

4.2 ETHICAL CONSIDERATIONS

4.2.1 Ethical clearance

Ethical clearance was sought from the Institutional Ethics Committee prior to the start of the study and the approval for the same was granted.

4.2.2Written informed consent

Subjects who fulfilled inclusion criteria were apprised about the purpose of the study and their rights as research subjects. Informed consent form was administered in English.

As all the subjects understood to spoke English, there was no requirement of translating the signed informed consent form into native language i.e., Tamil. Adequate time was given to each patient to go through the information sheet and their queries were answered.

Their right to withdraw anytime from the study and the need for willingness to participate voluntarily in the study was explained. All the subjects expressed their willingness to participate in the study by giving a signed informed consent. A sample information sheet and consent form is enclosed as Annexure

Figure 17: Getting prior consent from the participant

4.3 SUBJECTS:

The study subjects, comprised of 43 primary insomnia patients of age group between 20 - 40 yrs will participate in the study. The subjects will be referred by outpatient department and inpatient department of Govt Yoga and Naturopathy Medical College and Hospital, Chennai. After obtaining informed consent, the individual would be subjected to one day training on ajna chakra meditation.

4.4 SUBJECTIVE TOOLS FOR STUDY:

4.4.1Insomnia screening:

- Athens insomnia scale
- Pittsburgh sleep quality index
- Sleep diary : circadian sleep rhythm scale

4.5 SAMPLING SIZE:

43 participants of age group between 20 -40yrs will participate in the study. The subjects will be recruited from the Out – patient department and in patient department of Government Yoga and Naturopathy Medical College Hospital, Chennai

4.6 DURATION OF STUDY:

One year

4.7 SOURCE OF DATA:

Outpatient department (OPD) and inpatient department (IPD) patients visiting Govt. Yoga and Naturopathy Medical College, Arumbakkam, Chennai- 106

4.8 SUBJECT SELECTION:

Taking the subjects who are satisfying the following inclusion & exclusion criteria

4.8.1Inclusion criteria:

- Age group : between 20 and 40 years
- Sleeplessness for at least 1 month
- Provided written informed consent

4.8.2Exclusion criteria:

- Secondary insomnia
- Pregnancy, lactation.
- Immunodeficiency
- Any allergies
- Intake of antipsychotic or antidepressant drugs

- Participation in another clinical trial
- Unwilling for written consent

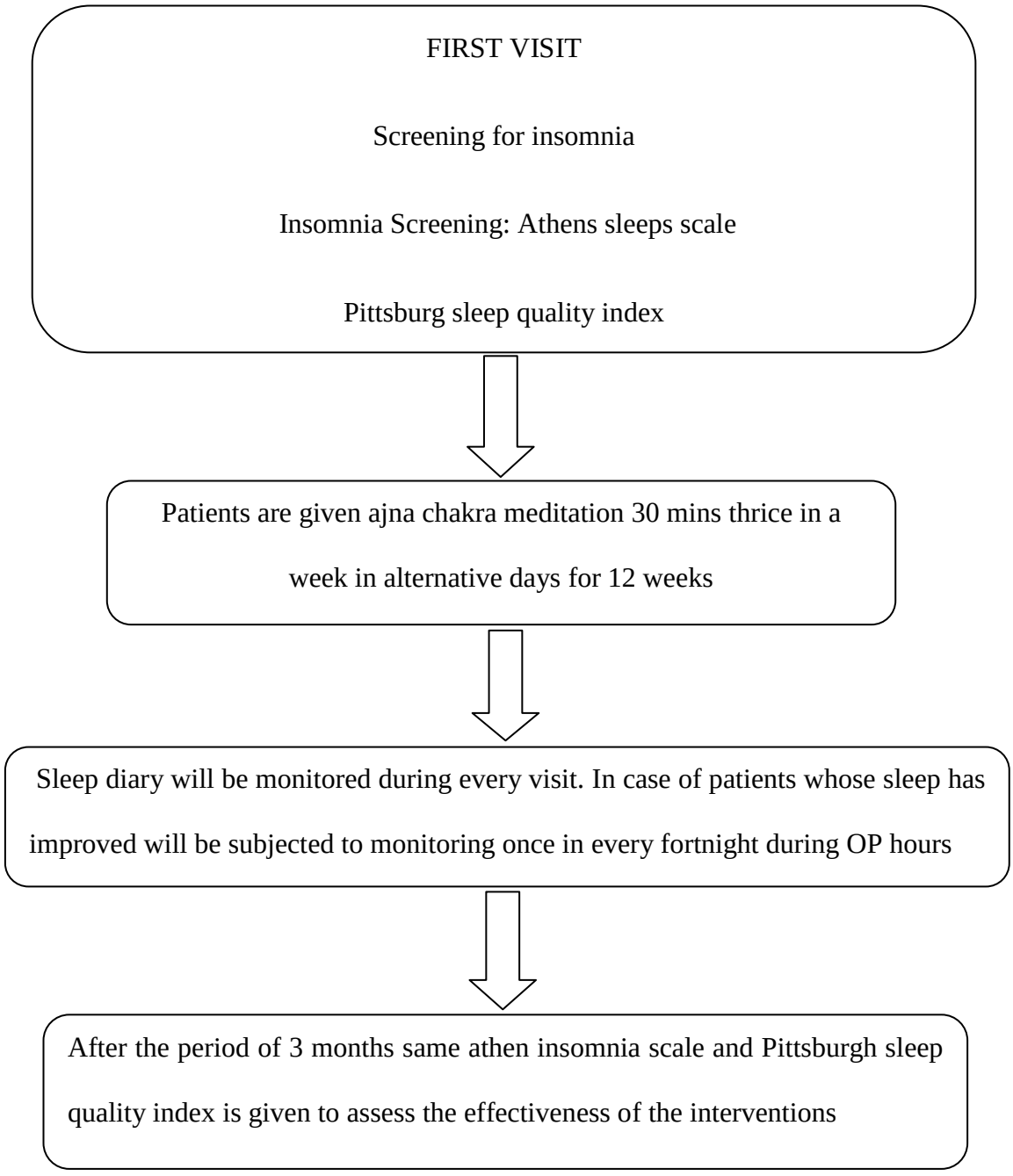
4.9 WITHDRAWAL CRITERIA:

All subjects are free to withdraw from participation in the study at any time, for any reason, specified or unspecified, and without prejudice to further yogic practices. Subjects who are withdrawn from the study will not be replaced.

4.10 METHOD OF COLLECTION OF DATA:

- During the first visit Athens sleep scale, Pittsburgh sleep quality index, will be given to collect the details about patients sleep history, trigger factors, relieving factors, treatment history and to assess their lifestyle pattern.
- Patients are given ajna chakra meditation 30 mins thrice in a week in alternative days for 12 weeks
- Sleep diary will be monitored during every visit.
- After the period of 3 months same Pittsburgh sleep quality index and Athens sleep scale is given to assess the effectiveness of the intervention.

4.11 STUDY PLAN



4.12 PROCEDURE FOR AJNA CHAKRA MEDITATION:

i. Sit with the legs straight in front of the body and adopt any comfortable meditative posture.

ii. Place the hands on the knees in chin mudra. Keep the back, neck and head upright and straight.

iii. Close the eyes and relax the whole body. Slowly bring the awareness towards the breath

iv. Inhale deeply and exhale slowly

v. Observe the breath the way you are inhaling and exhaling

vi. Now slowly bring the awareness towards the eye brow centre and concentrate on it

vii. The sixth chakra is the ajna chakra is located in between the two eyebrows, now slowly concentrate and visualize the chakra

viii. The chakras are connected to a network of psychic channels called nadis, which correspond to the nerves but are more subtle in nature.

ix. The chakras are depicted symbolically as lotus flowers, each having a particular number of petals and a characteristic colour.

x. The lotus symbolises the three stages the aspirant must pass through in spiritual life: ignorance, aspiration and illumination.

xi. It represents spiritual growth from the lowest state of awareness to the highest state of consciousness

xii. The petals of the lotus, inscribed with the beeja mantras or seed sounds of the Sanskrit alphabet, represent the different manifestations of psychic energy connected with the chakras and the nadis or psychic channels

xiii. Within the chakra is a yantra comprised of the geometrical symbol of its associated element and beeja mantra.

xiv. Within the yantra there is also a presiding deity, which represents particular aspects of divinity

xv. The ajna chakra is Situated in the midbrain, behind the eyebrow centre, at the top of the spine

xvi. The ajna chakra also known as the third eye, jnana chakshu, it means the eye of wisdom, triveni, it means the confluence of three rivers; guru chakra and the Eye of Shiva.

xvii. Ajna chakra is depicted as a silver lotus with two petals which represent the sun and the moon or pingala, the positive force, and ida, the negative force.

xviii. These two pranic flows which are responsible for the experience of duality and converge at this centre with sushumna, the spiritual force.

xix. In the centre of the lotus is the sacred beeja mantra "om".

xx. Inhale deeply and while exhaling chant the beeja mantra "om" internally for eight times slowly and rhythmically

xxi. Feel the resonance and vibration of "om" mantra in the body

xxii. Imagine and feel the energy flowing into the body

xxiii. The element of this chakra is manas, mind.

xxiv. This is the centre where wisdom and intuition develop.

xxv. When ajna is awakened, the mind becomes steady and strong, and full control over prana is gained.

xxvi. Imagine and visualize the two petals of the chakra

xxvii. Concentrate the two petals of the chakra

xxviii. Slowly bring the awareness towards the right side petal of the chakra and concentrate the movements

xxix. Now shift the awareness towards the left side of the petal, visualize it and concentrate the movements of the petal

xxx. Now slowly bring the awareness towards the centre of the chakra visualize the centre part of the chakra and the sacred beeja mantra om

xxxi. Feel the vibration and pressure over the centre point of the chakra

xxxii. Visualize the enlightening of the chakra

xxxiii. Feel brightness of the chakra. Feel the enlightens in the body

xxxiv. Feel the pressure over the eyebrow centre

xxxv. Observe the brightness ,feel the radiance, feel the enlightment of the chakra

xxxvi. take a deep inhale and Feel the positive energy entering into every part of the body

xxxvii. while slow exhale feel the negative energy is coming out from the body

xxxviii. Feel the lightness in the body. slowly shift the awareness towards the breath

xxxix. Concentrate on the breath. Feel the free flow of the breath that is the prana shakthi

xl. shift the awareness to the external environment

xli. now feel the changes in and around the place

xlii. slowly rub your palms nicely and make a cup of your hands and slowly keep it on your eyeballs

xliii. Feel the warmness and spread it to the entire body

xliv. keep your palms in front of your eyes, slowly open your eyes

Figure 18: Participants practicing Ajna chakra meditation

5.0 RESULTS

The following chapter represents the overall results of the current study that determines the effectiveness of practicing ajna chakra meditation. The resultant outcomes from the interventional studies were monitored from questionnaires which were further subjected to statistical analysis.

5.1 Statistical Analysis:

Statistical analysis was done using the statistical package for social sciences (SPSS 20.0). Different statistical methods were used as appropriate. Continuous variables are presented as Mean ± SD ordinal and Nominal data are presented as number and percentage. The paired t- test was performed on all continuous variables. A p- value < 0.05 was considered significant.

Univariate Analysis

Sex	No. of Patients	Percentage
Female	27	62.79
Male	16	37.21
Total	**43**	**100**

Table 2: Gender distribution

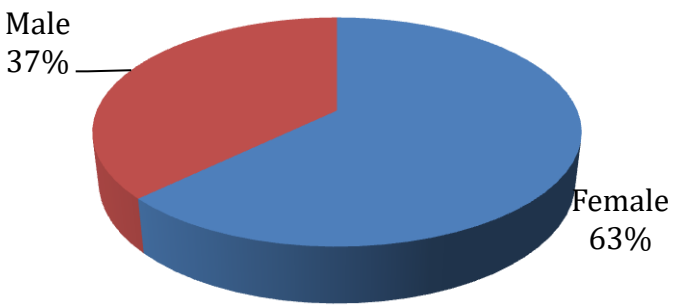


Figure19: Gender Distribution of patients

Total number of Patients enrolled in the study is 43. 63% of the Patients are Female and 37% of the patients are Male.

Age	No. of Patients	Percentage
25-30	14	32.6
31-35	10	23.3
36-40	19	44.2
Total	43	100
Mean Age	**33.58 ± 4.92**	

Table 3: Age distribution

Total number of Patients enrolled in the study is 43. The average Age of the study patients is 33.58 years.44.2% of the patients belongs to the Age group 36-40 years. 32. The distribution of patients in the age group 25-30 and 31-35 are 32.6 % and 23.3 % respectively.

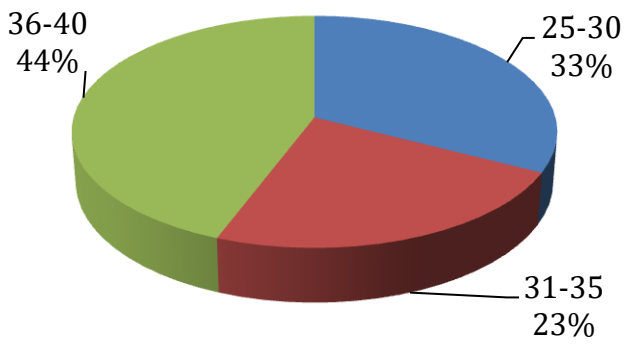


Figure 20: Age Group Distribution of patients

Anthropometric Characteristics	N	Mean ± S.D
Height (cm)	43	161.98 ± 11.11
Weight(kg)	43	62.40 ± 6.99
BMI	43	23.77 ± 2.78

Table 4: Characteristics of anthropometry measurements

The Average height of the Patients is 161.98 cm and the Average weight of the patients is 62.40kg. Most of the Patients belongs to normal BMI, its average is 23.77.

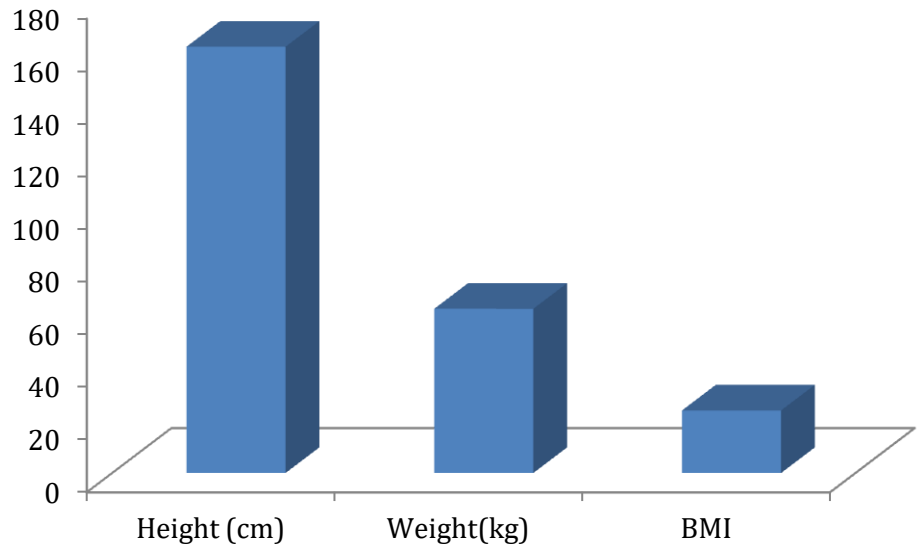


Figure 21: Anthropometric Characteristics of the patients

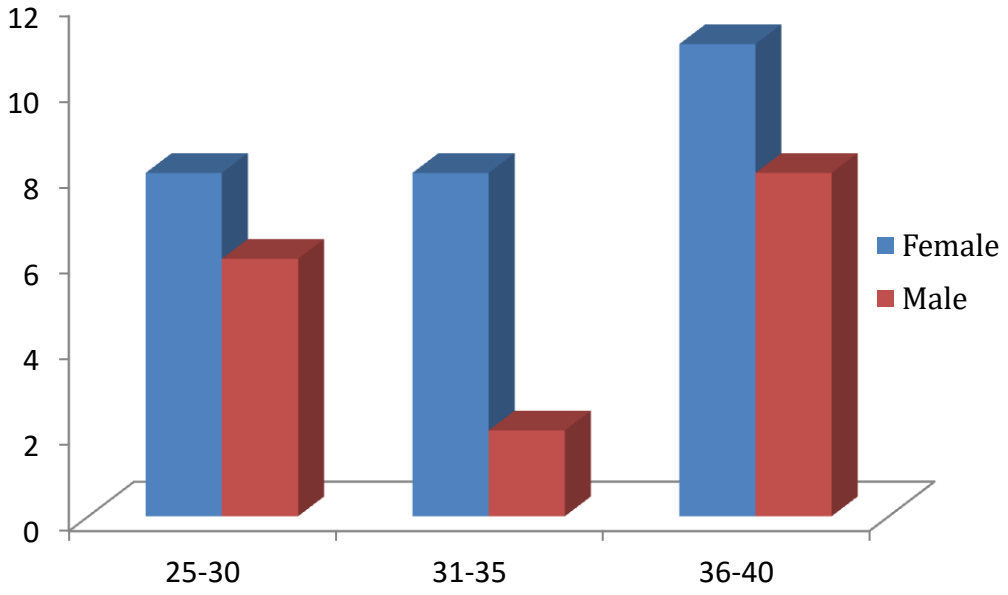
Bivariate Analysis

Age	Female	Male	Total
25-30	8 (57.1%)	6 (42.9 %)	14
31-35	8 (80.0 %)	2 (20.0 %)	10
36-40	11 (57.9 %)	8 (42.1 %)	19
Total	**27**	**16**	**43**

Table 5: Age group distribution among Gender

There are 14 patients in the age group 25-30 years with 57.1% of Female and 42.9% of Male. In the age group 31-35 years, 10 patients with 80.0% belongs to Female and 20% of male.19 patients belong to the age group 36-40 years, in which 57.9% of female and 42.1% of male.

Figure 22: Age group distribution among Gender



Age	Height	Weight	BMI
25-30	164 + 11.37	61 + 6.59	23 + 2.40
31-35	156 + 9.52	58 + 1.58	24 + 2.59
36-40	164 + 11.15	66 + 7.25	25 + 2.97

Table 6: Age Group wise Distribution among Anthropometric Characteristics

The average height of the age group 25-30years, 31-35 years and 36-40 years are 164cm, 156 cm and 164cm respectively. The Average weight of the age group 25-30 years, 31-35 years and 36-40 years are 61 kg, 58 kg and 66 kg respectively. The Average BMI of the age group 25-30years, 31-35 years and 36-40 years are 23 kg, 24 kg and 25 kg respectively.

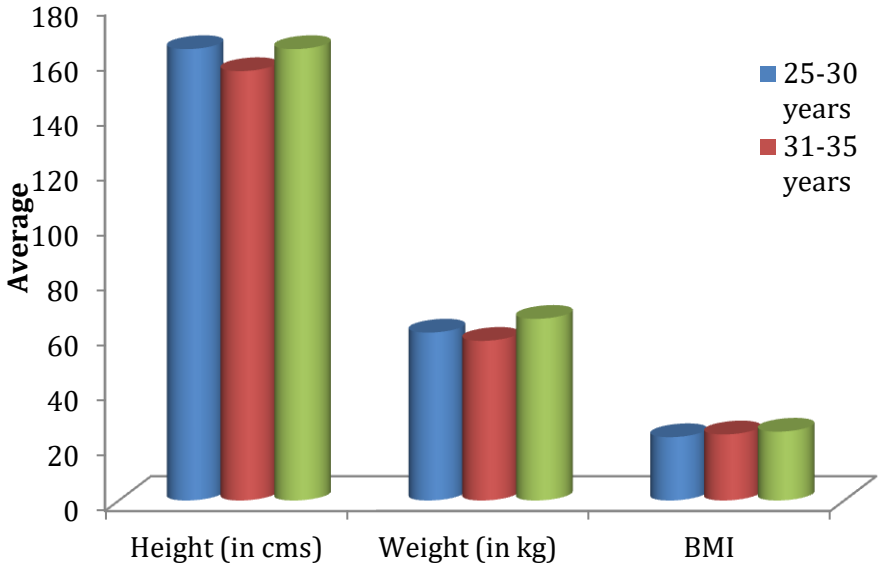


Figure 23: Graphical representation Age Group Distribution among Anthropometric Characteristics

Gender	Height	Weight	BMI
Female	155.11 + 6.7	59.37 + 5.41	24.48 + 2.74
Male	173.56 + 6.31	67.5 + 6.48	22.56 + 2.48
Total	161.98 ± 11.11	62.40 ± 6.99	23.77 ± 2.78

Table 7: Gender wise Distribution among Anthropometric Characteristics

The average heights, weight and BMI of the Female Patients are 155.11cm, 59.37 kg and 24.48 respectively. Male Patients have average heights of 173.56cms, average weights of 67.50kg and BMI of 22.56.

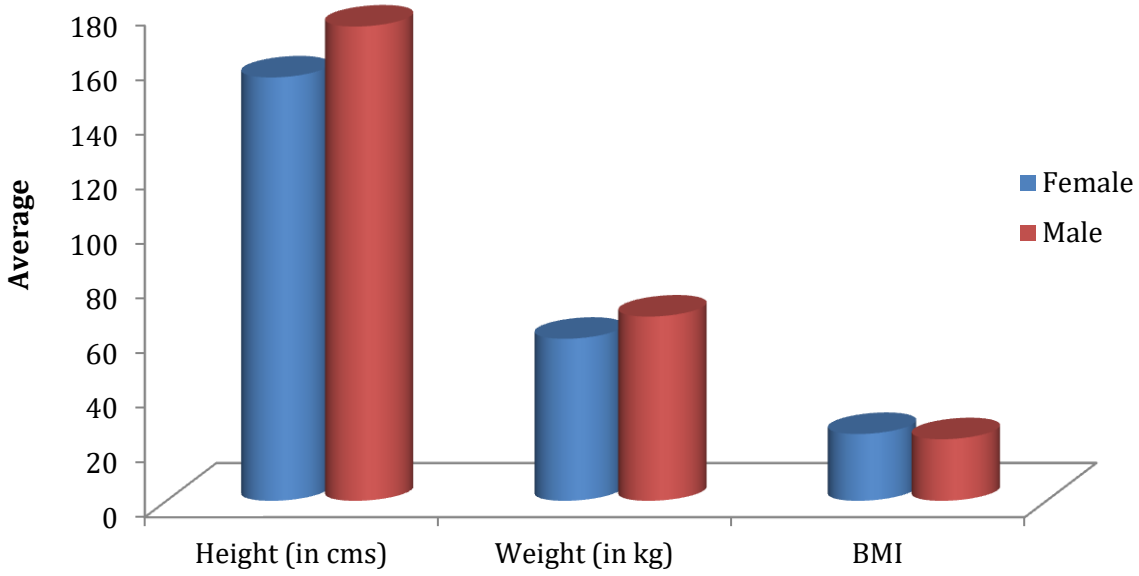


Figure 24: Graphical representation of Gender wise Distribution among Anthropometric Characteristics

Comparison of Pre treatment and post treatment variables

Out of 43 patients, 2 patients are Lost Follow up. So 41 patients' pre treatment (ATHEN'S and PSQI) and Post treatment (ATHEN'S and PSQI) were compared.

	N	Pre Treatment	Post treatment	P value
ATHEN'S	41	14.49 ± 3.18	9.37 ± 3.80	0.000
PSQI	41	12.71 ± 3.79	8.56 ± 3.26	0.000

Table 8: Comparison of Pre treatment and post treatment variables

The variables were expressed as mean ± Standard deviation.

ATHEN'S scale

The Average value of Athens before treatment is 14.49 and post treatment value is 9.37. The Athens Score is reduced after the treatment, which statistically significant with p value is 0.00 (<0.05)

PSQI scale

The Average value of PSQI before treatment is 12.71 and post treatment value is 8.56. The PSQI Score is reduced after the treatment, which statistically significant with p value is 0.00 (<0.05).

6.0 DISCUSSION

The present study shows the significant changes in the level of sleep pattern using the Athens scale & Pittsburgh scale in insomnia patients by the ajna chakra meditation for a period of 12 weeks. since insomnia is most prevalent in India and all over the word because of the shortened different sleeping time leading to stress, depression, anxiety, mental ill health, diabetes, hypertension, stroke, overweight or obesity, weak immune system, metabolic disorder etc increasing the prevalence of death. All these above factors leading to the confusion and frustration ending up with increased death by accidents.

In yoga many meditation techniques improve the sleeping pattern in which the ajna chakra meditation mainly stimulates the pineal gland and activates the secretion of melatonin and thereby increase the sleep time. The other positive effects are changes in frontal lobe to detach and relax, slows down the sensory and motor signals to cerebral cortex to keep the mind calm, changes in the parietal lobe to lower the stress and anxiety levels, reticular activity slows down.

Alpha rhythm increased in amplitude, slowed down in frequency and extended to anterior channels at the beginning of mediation. In a second stage, theta frequencies different from those of sleep diffused from frontal to posterior channels. They took the form of short theta periods or longer rhythmic theta trains. Rhythmic amplitude-modulated beta waves were present over the whole scalp in a third stage of deep meditation by advanced subjects. The most striking topographical alteration was the synchronisation of anterior and posterior channels. An MR study conducted at Harvard university showed that meditation

leads to thicker the gray matter in the parts of the brain that are associated with compassion and self awareness.

Studies states that the prevalence of insomnia increase the mortality rate hence by the practice of 30mins ajna chakra meditation will reduce the mortality rate by increasing the quality of sleep time & reducing the preceding ill factor.

7.0 CONCLUSION

The present study entitled "Efficacy of ajna chakra meditation in primary insomnia as shown better improvement on primary insomnia patient" and this study reveals that chakra meditation is more effient for sleeplessness problem. According to yogic point of view insomnia is mainly caused due to the imbalance in the manomayakosha. The practice of chakra meditation influences through manomaya kosha to annamaya kosha. The chakra meditation improves the pranic energy level and its distributes the energy to the whole body. By balancing the pranic energy level so that the manomaya kosha gets awakened.ida and pingala which represents the sympathetic and parasympathetic system which gets activated and the mind becomes strong and activated. This chakra correlates with the pineal gland by meditating on this chakra the pineal gland gets activated and release of melatonin, influences the sleep.

7.0.1 LIMITATIONS

i. The current study was a pilot study comprising only of minimal number of subjects.

ii. In this study only subjective variables are used.

7.0.2 RECOMMENDATIONS

i. The same study can be conducted on a larger population with suitable study design and some objective kind of outcome variables could be included to validate the current results.

ii. In future more evidence based researches has to be done on ajna chakra meditation

8.0 SUMMARY

The study is about to find the efficacy of ajna chakra meditation in primary insomnia patients using the Athens scale & Pittsburgh scale. The main purpose is to induce sleep and reduce the anxiety and stress factors leading to the psychosomatic disorders.

In this study 43 participants with primary insomnia randomly selected, with informed consent form. all the candidates were asked to fill the pre assessment form followed by ajna chakra meditation weakly thrice for 12weekss and finally post assessment form was filled. Based upon the assessment the variables were expressed as mean $\pm$ standard deviation.

The Average value of Athens before treatment is 14.49 and post treatment value is 9.37. The Athens Score is reduced after the treatment, which statistically significant with p value is 0.00 (<0.05) The Average value of PSQI before treatment is 12.71 and post treatment value is 8.56. The PSQI Score is reduced after the treatment, which statistically significant with p value is 0.00 (<0.05).

From the p value there is significant changes in the sleep pattern by activating the pineal gland and inducing the melatonin secretion which induces the sleep. Even it corrects the manamaya kosha which influence the mind. By practising this meditation in daily life style there will be a decline in mortality rate due to insomnia and will increase the overall life expectancy.

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10.0 ANNEXURE

10.1 INFORMED CONSENT FORM

Title of the study**: "EFFICACY OF AJNA CHAKRA MEDITATION IN PRIMARY INSOMNIA- AN EXPERIMENTAL STUDY"**

Name of the Participant :

Name of the Principal Investigator : Dr.M.C.RAJALAKSHMI

Name of the Institution : Government Yoga & Naturopathy Medical College &Hospital, Chennai – 600 106

Documentation of the informed consent

I _____ have read the information in this form (or it has been read to me). I was free to ask any questions and they have been answered. I am over 18 years of age and, exercising my free power of choice, hereby give my consent to be included as a participant in

1. I have read and understood this consent form and the information provided to me.

2. I have had the consent document explained to me.

3. I have been explained about the nature of the study.

4. I have been explained about my rights and responsibilities by the investigator.

5. I have been informed the investigator of all the treatments I am taking or have taken in the past _____ months including any native (alternative) treatment.

6. I have been advised about the risks associated with my participation in this study.

7. I agree to cooperate with the investigator and I will inform him/her immediately if I suffer unusual symptoms.

8. I have not participated in any research study within the past _____month(s).

9. I am aware of the fact that I can opt out of the study at any time without having to give any reason and this will not affect my future treatment in this hospital.

10. I am also aware that the investigator may terminate my participation in the study at any time, for any reason, without my consent.

12. I hereby give permission to the investigators to release the information obtained from me as result of participation in this study to the sponsors, regulatory authorities, Govt. agencies, and IEC. I understand that they are publicly presented.

13. I have understood that my identity will be kept confidential if my data are publicly presented.

14. I have had my questions answered to my satisfaction.

15. I have decided to be in the research study.

I am aware that if I have any question during this study, I should contact the investigator.

By signing this consent form I attest that the information given in this document has been clearly explained to me and understood by me, I will be given a copy of this consent document.

For adult participants:

Name and signature / thumb impression of the participant (or legal representative if participant incompetent)

Name _____ Signature_____

Date_____

Name and Signature of impartial witness (required for illiterate patients):

Name _____ Signature_____

Date_____

Address and contact number of the impartial witness:

Name and Signature of the investigator or his representative obtaining consent:

Name _____ Signature_____

Date_____

ATHENS INSOMNIA SCALE

This scale is intended to record your own assessment of any sleep difficulty you might have experienced. Please, check (by circling the appropriate number) the items below to indicate your estimate of any difficulty, provided that it occurred at least three times per week during the last month.

1. SLEEP INDUCTION *(time it takes you to fall asleep after turning-off the lights)*

0	**1**	**2**	**3**
No problem	Slightly delayed	Markedly delayed	Very delayed or did not sleep at all

2. AWAKENINGS DURING THE NIGHT

0	**1**	**2**	**3**
No problem	Minor problem	Considerable problem	Serious problem or did not sleep at all

3. FINAL AWAKENING EARLIER THAN DESIRED

0	**1**	**2**	**3**
Not earlier	A little earlier	Markedly earlier	Much earlier or did not sleep at all

4. TOTAL SLEEP DURATION

0	**1**	**2**	**3**
Sufficient	Slightly insufficient	Markedly insufficient	Very insufficient or did not sleep at all

5. OVERALL QUALITY OF SLEEP *(no matter how long you slept)*

0	**1**	**2**	**3**
Satisfactory	Slightly unsatisfactory	Markedly unsatisfactory	Very unsatisfactory or did not sleep at all

6. SENSE OF WELL-BEING DURING THE DAY

0	**1**	**2**	**3**
Normal	Slightly decreased	Markedly decreased	Very decreased

7. FUNCTIONING (PHYSICAL AND MENTAL) DURING THE DAY

0	**1**	**2**	**3**
Normal	Slightly decreased	Markedly decreased	Very decreased

8. SLEEPINESS DURING THE DAY

0	**1**	**2**	**3**
None	Mild	Considerable	Intense

PITTSBURGH SLEEP QUALITY INDEX (PSQI)

INSTRUCTIONS: The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

1. During the past month, when have you usually gone to bed at night?

   USUAL BED TIME _____

2. During the past month, how long (in minutes) has it usually take you to fall asleep each night?

   NUMBER OF MINUTES _____

3. During the past month, when have you usually gotten up in the morning?

   USUAL GETTING UP TIME _____

4. During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spend in bed.)

   HOURS OF SLEEP PER NIGHT _____

INSTRUCTIONS: For each of the remaining questions, check the one best response. Please answer all questions.

5. During the past month, how often have you had trouble sleeping because you...

	Not during the past month	Less than once a week	Once or twice a week	Three or more times a week
(a) ...cannot get to sleep within 30 minutes	☐	☐	☐	☐
(b) ...wake up in the middle of the night or early morning	☐	☐	☐	☐
(c) ...have to get up to use the bathroom	☐	☐	☐	☐
(d ...cannot breathe comfortably	☐	☐	☐	☐
(e) ...cough or snore loudly	☐	☐	☐	☐
(f) ...feel too cold	☐	☐	☐	☐
(g) ...feel too hot	☐	☐	☐	☐
(h) ...had bad dreams	☐	☐	☐	☐
(i) ...have pain	☐	☐	☐	☐

(j) Other reason(s), please describe

_____

_____

How often during the past month have you had trouble sleeping because of this?	☐	☐	☐	☐

	Very good	Fairly good	Fairly bad	very bad
6. During the past month, how would you rate your sleep quality overall?	☐	☐	☐	☐

	Not during the past month	Less than once a week	Once or twice a week	Three or more times a week
7. During the past month, how often have you taken medicine (prescribed or "over the counter") to help you sleep?	☐	☐	☐	☐
8. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?	☐	☐	☐	☐

	No problem at all	Only a very slight problem	Somewhat of a problem	A very big problem
9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?	☐	☐	☐	☐

	No bed partner or roommate	Partner/ roommate in other room	Partner in same room, but not same bed	Partner in same bed
10. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?	☐	☐	☐	☐

If you have a roommate or bed partner, ask him/her how often in the past month you have had...

	Not during the past month	Less than once a week	Once or twice a week	Three or more times a week
(a) ...loud snoring	☐	☐	☐	☐
(b) ...long pauses between breaths while asleep	☐	☐	☐	☐
(c) ...legs twitching or jerking while you sleep	☐	☐	☐	☐
(d) ...episodes of disorientation or confusion during sleep	☐	☐	☐	☐
(e) Other restlessness while you sleep; please describe	☐	☐	☐	☐

_____

_____

SCORING INSTRUCTIONS FOR THE PITTSBURGH SLEEP QUALITY INDEX:

The Pittsburgh Sleep Quality Index (PSQI) contains 19 self-rated questions and 5 questions rated by the bed partner or roommate (if one is available). Only self-rated questions are included in the scoring. The 19 self-rated items are combined to form seven "component" scores, each of which has a range of 0-3 points. In all cases, a score of "0" indicates no difficulty, while a score of "3" indicates severe difficulty. The seven component scores are then added to yield one "global" score, with a range of 0-21 points, "0" indicating no difficulty and "21 " indicating severe difficulties in all areas.

Scoring proceeds as follows:

Component 1: Subjective sleep quality

Examine question #6, and assign scores as follows:

Response	Component 1 score
"Very good"	0
"Fairly good"	1
"Fairly bad"	2
"Very bad"	3

Component 1 score:_____

Component 2: Sleep latency

1. Examine question #2, and assign scores as follows:

Respo\nse	Score
≤15 minutes	0
16-30 minutes	1
31-60 minutes	2
> 60 minutes	3
Question #2 score:	_____

2. Examine question #5a, and assign scores as follows:

Response	Score
Not during the past month	0
Less than once a week	1
Once or twice a week	2
Three or more times a week	3
Question #5a score:	_____

3. Add #2 score and #5a score

Sum of #2 and #5a: _____

4. Assign component 2 score as follows:

Sum of #2 and #5a	Component 2 score
0	0
1-2	1
3-4	2
5-6	3

Component 2 score:_____

Component 3: Sleep duration

Examine question #4, and assign scores as follows:

Response	Component 3 score
> 7 hours	0
6-7 hours	1
5-6 hours	2
< 5 hours	3

Component 3 score:_____

Component 4: Habitual sleep efficiency

1. Write the number of hours slept (question #4) here:_____
2. Calculate the number of hours spent in bed:

   Getting up time (question #3):_____

   Bedtime (question #1):_____

   _____

   *Number of hours spent in bed:*_____

3. Calculate habitual sleep efficiency as follows:

   (Number of hours slept/Number of hours spent in bed) X 100 = Habitual sleep efficiency (%)

   (_____/_____) X 100 = %

4. Assign component 4 score as follows:

Habitual sleep efficiency %	Component 4 score
> 85%	0
75-84%	1
65-74%	2
< 65%	3

Component 4 score:_____

Component 5: Step disturbances

1. Examine questions #5b-5j, and assign scores for each question as follows:

Response	Score
Not during the past month	0
Less than once a week	1
Once or twice a week	2
Three or more times a week	3

5b score: _____

5c score: _____

5d score: _____

5e score: _____

5f score: _____

5g score: _____

5h score: _____

5i score: _____

5j score: _____

2. Add the scores for questions #5b-5j:

Sum of #5b-5j: _____

3. Assign component 5 score as follows:

Sum of #5b-5j	Component 5 score
0	0
1-9	1
10-18-4	2
19-27	3

Component 5 score: _____

Component 6: Use of sleeping medication

Examine question #7 and assign scores as follows:

Response	Component 6 score
Not during the past month	0
Less than once a week	1
Once or twice a week	2
Three or more times a week	3

Component 6 score: _____

Component 7: Daytime dysfunction

1. Examine question #8, and assign scores as follows:

Response	Score
Never	0
Once or twice	1
Once or twice each week	2
Three or more times each week	3

Question#8 score: _____

2. Examine question #9, and assign scores as follows:

Response	Score
No problem at all	0
Only a very slight problem	1
Somewhat of a problem	2
A very big problem	3

Question #9 score: _____

3. Add the scores for question #8 and #9:

Sum of #8 and #9: _____

4. Assign component 7 score as follows:

Sum of #8 and #9	Component 7 score
0	0
1-2	1
3-4	2
5-6	3

Component 7 score: _____

Global PSQI Score

Add the seven component scores together:

Global PSQI Score: _____